MONTANA SECOND JUDICIAL DISTRICT COURT

SILVER BOW COUNTY

GREGORY A. CHRISTIAN, et al.,	)	
	)	
Plaintiffs,	)	
	)	
vs.	)	No. DV-08-173
	)	
BP AMOCO CORPORATION, et al.,	)	
ATLANTIC RICHFIELD COMPANY, et al.,	)	
	)	
Defendants.	)	
	)	

DEPOSITION OF RICHARD C. PLEUS, Ph.D.

Seattle, Washington

Monday, July 29, 2013

Reported by:

MARIANNA DONNER

CSR No. 7504

JOB No. 304822

MONTANA SECOND JUDICIAL DISTRICT COURT
SILVER BOW COUNTY

GREGORY A. CHRISTIAN, et al.,)
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Plaintiffs,)
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vs.) No. DV-08-173
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BP AMOCO CORPORATION, et al.,)
ATLANTIC RICHFIELD COMPANY,)
et al.,)
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Defendants.)
)

Videotaped Deposition of
RICHARD C. PLEUS, Ph.D., pages 1 through 255, taken on behalf of Defendant Atlantic Richfield Company, at 2801 Alaskan Way, Suite 300, Seattle, Washington, beginning at 9:36 a.m. and ending at 5:27 p.m. on Monday, July 29, 2013, before MARIANNA DONNER, Certified Shorthand Reporter No. 7504, Registered Professional Reporter No. 38410.

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Also Present:
BROOK YOUNG, Videographer

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EXHIBITS

Seattle, Washington

Monday, July 29, 2013

9:36 a.m. - 5:27 p.m.

09:36 THE VIDEOGRAPHER: This is the deposition of Richard Pleus in the matter of Gregory A. Christian, et al., versus BP Amoco Corporation, et al., cause number DV-08-173 in the Montana Second Judicial District Court, Silver Bow County, and was noticed by Davis, Graham & Stubbs LLP.

The time now is approximately 9:36 a.m. on this 29th day of July 2013, and we are convening at 2801 Alaskan Way, Suite Number 300, in Seattle, Washington.

My name is Brook Young from Buell Realtime Reporting, LLC, located at 1411 Fourth Avenue, Suite Number A-20 in Seattle, Washington 98101, working on behalf of Biehl, et al., Certified Shorthand Reporters, Inc.

Starting on my left, would counsel and all present please identify themselves for the record.

MS. STEVENSON: Shannon Stevenson on behalf of the defendant Atlantic Richfield Company.

MR. STALPES: Justin Stalpes on behalf of the plaintiffs.

THE VIDEOGRAPHER: And would the parties on the phone identify themselves, please.

MR. THIESZEN: Mark Thieszen at Poore, Roth & Robinson in Butte, Montana, on behalf of defendants Atlantic Richfield Company.

MS. DROLL: Emily Droll of Davis, Graham & Stubbs on behalf of defendant Atlantic Richfield Company.

THE VIDEOGRAPHER: The court reporter may now swear in the witness.

(Witness sworn.)

THE WITNESS: Yes.

RICHARD C. PLEUS, Ph.D.,
having been first duly sworn,
was examined and testified as follows:

EXAMINATION

BY MS. STEVENSON:

Q Good morning, Dr. Pleus. I'm Shannon Stevenson. I'm a lawyer. I represent Atlantic Richfield Company in this matter.

Can you give us your full name for the record.

A Yes. Richard Carl Pleus.

Q And do you understand that you are here today to testify because you've disclosed certain expert opinions in this matter?
A Yes.
09:37 Q You've had your deposition taken before, correct?
A I have.
Q How many times, do you think?
A I think in the past 20 years or so, my best
09:37 recollection is maybe 40. Somewhere between 30 and 40 possibly.
Q Roughly twice a year?
A Roughly.
Q Okay. So you are familiar with this drill?
09:38 A As much as I can be. But this is not my main job, if you will.
Q I'll just remind you that you are under an oath to tell the truth today just as if you were testifying in front of a judge and jury.
09:38 Do you understand that?
A I do.
Q And that your answers should be truthful and accurate to the best of your ability?
A Correct. I understand.
09:38 Q You understand that Marianna, our court

reporter, is typing down everything that we say?

A I do.

Q And that so we should try not to speak over each other if we can help it for her benefit.

09:38 A I understand.

Q Is there any reason today why you wouldn't be able to give your best and most accurate answers to my questions?

A Nothing that I'm aware of.

09:38 Q I am certain today at some time I will ask a question that makes no sense. If I ask a question that you don't understand, will you let me know?

A I will.

Q Did you do anything to prepare for this

09:39 deposition?

A I did.

Q What did you do?

A I've done a number of things. One would be to prepare an expert report. Another would be to

09:39 review a report by Dr. Joyce Tsuji. Another task I was asked to do was to look at the CDM Human Health Risk Assessment. Another thing I was -- I did in preparation was to review a number of papers that relate to the risk assessment or relate to

09:39 Dr. Tsuji's expert reports.

Those are some of the things that I can think of.

Q And setting aside the work that you did to prepare for your -- to draft your expert reports, your initial report and your rebuttal report in this case, did you do anything specific to prepare for the deposition?

A I sat down and reviewed all of those documents or reviewed a number of documents. Those are the things that I specifically did for preparation here.

Q Did you meet with any attorneys to prepare?

A I didn't meet with any attorneys, but I have met with Mr. Stalpes, if I said that correctly. I met him this morning. We had a cup of coffee. I've had brief conversations in terms of what do I -- the deposition date, just simple things along that line.

Q Following the preparation of your expert reports but in advance of this deposition, did you review any additional research?

MR. STALPES: Objection; vague.

THE WITNESS: When you say "additional research," there were documents that I have provided in my expert report and the references that are produced in Dr. Tsuji's report.

Is there anything more specific that you are asking for?

BY MS. STEVENSON:

Q Did you review anything additional to those materials that you had reviewed in the course of preparing your expert report in order to prepare for this deposition?

A Nothing that I can recall.

Q Did you do any research on the Internet or any other sources after preparing your report but before this deposition?

A Nothing that I can recall other than just fact checking as questions came up during my review of the documents.

(Deposition Exhibit 1 was marked for identification and is attached hereto.)

BY MS. STEVENSON:

Q Handing you what's been marked Exhibit 1. This was a letter I received from plaintiffs' counsel on Friday that appears to be a supplement to your expert report.

Do you agree with that?

A Yes.

Q And this is a letter that you authored?

A Yes.

Q And as I understand it, you are correcting a mistake that was in your initial expert report; is that correct?

09:42 A Well, I think Dr. Tsuji was able to provide a little bit more information for which then I made a correction.

Q And your original opinion, I believe, was that the ratio of arsenic concentration in soil to

09:42 interior dust was higher than the ratio that was used by CDM in preparing the human health risk assessment; is that right?

MR. STALPES: Object to the form.

THE WITNESS: Can you repeat that, please?

09:42 BY MS. STEVENSON:

Q Sure.

Can you read that back?

(The record was read as follows:

"QUESTION: And your original opinion, I believe, was that the ratio of arsenic concentration in soil to interior dust was higher than the ratio that was used by CDM in preparing the human health risk

09:43 assessment; is that right?")

THE WITNESS: Yes, and I think the -- in part, it was -- or in full disclosure was I think the lack of clarity in terms of some of the reports that I had read. So this just provided a little bit more information.

BY MS. STEVENSON:

Q Okay. And as a result of this information, you concluded that the ratio used by CDM was correct.

Is that fair to say?

A I don't think "correct" is specific here. I think it was in the -- it was in a ballpark that was more consistent with the data that has been generated.

Q And as I understand it, the correction you were making is that you had originally understood some sampling from Pioneer to be reporting arsenic concentration in soil when it was, in fact, reporting arsenic concentration in exterior dust; is that right?

A After reading through the report of the 2009 Pioneer dataset, it wasn't particularly clear exactly what they were referring to at that time. So it made sense based on the limited information that they provided.

Q And you thought that they were referring to

soil; is that right?
A It wasn't clear, but it seemed that that would make the most sense at the time.
Q And that's what you reported in your original expert report?
A That's my original interpretation, which has then been corrected by this.
Q So you've corrected that now to reflect that they were actually reporting arsenic concentration in exterior dust; is that right?
MR. STALPES: Objection; asked and answered.
THE WITNESS: I'm sorry. Can you repeat that, please.
BY MS. STEVENSON:
Q Sure.
The correction that you are making is to now reflect your understanding that what they were actually reporting was not arsenic concentration in the soil but in exterior dust?
MR. STALPES: Same objection.
THE WITNESS: Yes. The value in the Pioneer 2009 for the -- under the category "Exterior" was for dust, not for soil.
BY MS. STEVENSON:
Q And as a result of that, you modified the

risk assessment that you conducted in your expert report; is that correct?

A Well, I think modified is a term that, yes, the value was then corrected but the overall impact was minuscule.

Q Okay. The overall impact was a change from the screening level from 7.4 -- you have milligrams per kilogram.

Is milligrams per kilogram the same as parts per million?

A It can be, yes.

Q For arsenic, is it?

A Yeah.

Q So that resulted in you changing your screening level from 7.4 parts per million to 9.7 parts per million.

Is that fair to say?

A Yes. Roughly that's the change based on the calculations that I performed.

Q Are there any other aspects of your report that you changed your mind about after reviewing Dr. Tsuji's report?

MR. STALPES: Object to the form, mischaracterization of what happened here.

THE WITNESS: If you could just repeat that

part.
BY MS. STEVENSON:
Q Sure.
After reviewing Dr. Tsuji's report, did you change any of your opinions, other than the one mentioned in Exhibit 1, with respect to your report?
MR. STALPES: Object to the form.
THE WITNESS: Well, if what you are asking is did I change my opinion, the answer is no. That what I did was correct one data point out of literally tens or dozens or hundreds of them and that that particular point really had minuscule effect on doing -- on conducting of a standard risk assessment.
BY MS. STEVENSON:
Q Sure. I understand your point.
You didn't -- meaning that you didn't change your overall opinion based on this -- what you've pointed out in Exhibit 1, right?
A Correct.
Q Were there any parts of your opinion that you gave in your opening report that you changed your mind about in any way after reviewing Dr. Tsuji's report?
MR. STALPES: Objection; vague.
THE WITNESS: If what you are asking is after

reviewing Dr. Tsuji's report, did I -- was there any other information that was useful in conducting my risk assessment, the answer is no.

BY MS. STEVENSON:

09:48 Q And what about after reviewing Dr. Tsuji's rebuttal report?

A After reviewing Dr. Tsuji's rebuttal report, I looked at it very carefully, examined it and again when you compare that to conducting a standard risk 09:48 assessment, I had no changes that I felt were necessary.

(Deposition Exhibit 2 was marked for identification and is attached hereto.)

09:48 BY MS. STEVENSON:

Q Dr. Pleus, handing you Exhibit 2, which was the notice for your deposition today.

Did you receive a copy this?

A I did.

09:48 Q There was a subpoena portion of this that asked you to bring any and all invoices and/or other documents evidencing time spent by you and others in the preparation of your expert reports.

Did you bring any documents like that today?

09:49 A I did.

Q Okay. And do you have them with you?
A I do.
Q We'll take a break a little bit later and I can hopefully review those and/or make a copy of them.
A That's fine.
(Deposition Exhibit 3 was marked for identification and is attached hereto.)
BY MS. STEVENSON:
Q I want to take a little bit of time to ask you about your CV, which I've marked there as Exhibit 3, and this is just a copy of the one that was in your -- provided in your expert report.
Do you recognize that?
A Yes, I do.
Q Starting with your education, you have listed there your Bachelor's from Michigan State, Master's from University of Minnesota and a PhD at University of Minnesota in environmental toxicology; is that right?
A That's correct.
Q Do you have any other post high school degrees?
A Degrees specifically?

Q Yes.
A No degrees.
Q Do you have any other educational background that is relevant to the expertise that you are relying on in this case?
A Yes. I mentioned post doctoral training in neuropharmacology. I think that's sufficient. I've taken I think they are called workshops, intensive workshops, for example, in epidemiology at the University of Minnesota. I've taken other courses throughout my roughly 25-plus years as a toxicologist. I continue to teach courses from time to time or give lectures in areas of toxicology. Those are some examples that I can think of.
Q When you talked about the workshops in epidemiology that you have taken, how many workshops like that have you done?
A Well, one that I can recall relatively clearly is one, and it was I believe three to four weeks of pretty intensive daily lectures at the University of Minnesota on epidemiology.
Q When did do you that course?
A The best of my recollection would be in the 1980s.
Q Are there any other workshops that you have

taken on epidemiology that you think are relevant to your expertise in this case?

A None that I can recall, but I have also conducted workshops where I've been the instructor on risk assessment and the process of risk assessment. I think that would apply to this as well.

Q All right. Any other education that you've had where you have been the student, besides the workshop you just mentioned, that you think is relevant to your expertise in this case?

A Nothing that I can recall, but I do understand that I have had other workshops that I've attended.

Q You brought up your teaching. And from your resume, it looks like you were a university instructor from approximately 1979 until about 1989.

Is that accurate?

A I think that's a reasonable estimate. There were different positions that I held within that particular college, for example, whether it was an instructor or some type of associate, whatever the university had at that time for its classification system.

Q What type of courses did you teach during that time period?

A During that time period, I taught an introductory environmental sciences course. I also taught a human physiology course. Those were undergrad. First or second year science-type courses. I also taught courses in pharmacology, neuropharmacology. I also taught courses in integrating science into a more multidisciplinary approach. And those were all upper level undergraduate courses.

09:54 Q Did you teach any graduate level courses during that period of time?

A I did not teach any graduate courses during that time.

Q You didn't even have a graduate degree at that time I guess; is that right? Or you had a Master's?

A I had a Master's and I was working on my PhD at the time.

Q Are any of the courses that you taught between 1979 and 1989, do you think any of those relate to the expertise that you are relying on to give your opinions in this case?

MR. STALPES: Objection; vague and form.

THE WITNESS: I'm not quite sure I understand your question.

BY MS. STEVENSON:

Q Sure.

Would you point to any of the courses that you taught between 1979 and 1989 as sources of the expertise that you are relying on to give your opinions in this case?

MR. STALPES: Objection; broad.

THE WITNESS: If what you are asking is is there any course material specifically within those courses that I'm using for my expertise today, the answer is no.

BY MS. STEVENSON:

Q Now, you received your PhD in 1991; is that right?

A Yes.

Q And did you have some post doctoral training there; is that right?

A Correct.

Q From University of Nebraska?

A Medical Center, yes.

Q And tell me about your post doc training.

A It's roughly two and a half years for a post doc, and that's basically what it was for this. And it was in the training of neuropharmacology. Basically looking at how drugs and designing drugs to

specifically affect the nervous system. And that was -- pretty much was the type of research that I was conducting at the time.

Q Okay. Looks like your dissertation was on neurobehavioral assessment in offspring of the influence of maternal hypoxia and hypercapnia induced by injection of methadone in pregnant rats.

Did I read that correctly?

A You read that correctly.

Q Did your PhD, your dissertation concern issues related to risk assessments?

A The -- there were courseworks during my PhD that related to risk assessments. The department that I matriculated from was the school of public health in the division of -- I can't recall. I think they've changed their name in the last ten years, but something like environmental health and safety or environmental and occupational health. The division, I'm not quite sure what the name is today.

And so part of the curriculum was to take coursework in not only toxicology but risk assessment, epidemiology, biostastistics, things along that line.

Q And what about with respect to your

dissertation specifically, did that concern any issues related to risk assessment?

A The dissertation document itself did not pertain to risk assessment.

09:57 Q Did you do any coursework for your PhD that related to arsenic?

A Yes.

Q What courses did you have that related to arsenic?

09:58 A Well, I'll probably repeat myself of what I just mentioned here, but courses in toxicology, for which I took several. There were journal clubs or journal courses, which means that we are provided -- students are provided documents to review, such as 09:58 studies that are cited in both my report and Dr. Tsuji's report. There are courses in epidemiology that talk about how populations are assessed and evaluated for exposure to both arsenic and lead and a number of other toxicants. There are 09:58 courses in biostastistics as well that would talk about the approaches to analyzing datasets, and I recall that there were data for arsenic as well as a number of other toxicants as well.

Q Can you tell me about any specific training 09:59 that you had during your PhD coursework, other than

what you've just described, that related to arsenic toxicology?

A Can you be a little bit more specific? I'm not sure I follow you.

09:59 Q Sure.

I just want to make sure that I understand that if you've gained any particular expertise with respect to arsenic during your PhD coursework that I know what that is. So if there's anything that you would say, oh, yes, I gained particular expertise on arsenic, you know, taking this class or working on this particular journal project, I just want to know what that is.

MR. STALPES: Objection; vague and broad.

09:59 THE WITNESS: I think the way that I answered your question previously would be the -- I would repeat my answer.

BY MS. STEVENSON:

Q Okay.

09:59 A There's nothing specifically that I would point back to related to this -- the questions that I was asked to look at in this case that is one particular point --

Q Okay.

10:00 A -- if I'm answering your question correctly.

Q I think we're on the same page.

All right. And what about in your post doc training, was there any work that you did during your post doc training that you think gave you any specific expertise related to arsenic toxicology?

A Well, the post doc training focused a lot more on what we call the biochemistry or the pharmacology of chemicals whether they be therapeutic agents or toxicants, whereas my PhD looked more at the whole animal. So there's -- the idea was to get more expertise on the biochemistry pharmacology.

To that degree, my post doc provided a strong basis from which to read studies on biochemistry or how agents are provided to animals, whether they are, for example, in a bolus or in an inhalation or something along that line. So it provided a lot of guidance and experience in those areas that would apply in general to the issues at hand, at least that I was asked to look at.

Q And other than what you've just described, anything specific that you would point to during your post doc training that helped you understand arsenic toxicology?

MR. STALPES: Objection; asked and answered, broad.

THE WITNESS: If what you are asking is there anything specific within my research and time that I'm bringing to the table in my expert report, I would address the same response. It provided a very strong fundamental basis for which I conduct my practice.

BY MS. STEVENSON:

Q After your post doc training, did you go to work at Environmental Toxicology International?

A I did.

Q And what kind of company was that?

A It goes by the acronym ETI. If I may just use that for --

Q Sure.

A -- the time being.

ETI was a consulting -- toxicology consulting firm. I think, as the name implies, Environmental Toxicology International, ETI, I think embraces the concept of that. The work was to review risk assessments, conduct risk assessments, conduct toxicological studies. Those are some of the things that the company performed.

Q When you were at ETI --

How large of a company was ETI when you were there?

A I don't recall specifically, but ballpark figure might be 10 to 14 people, something like that.

Q And did you have a particular subspecialty as a toxicologist at ETI?

10:03 A Well, when I entered ETI, I did not. I came in as a general toxicologist. The firm conducted a number of types of risk assessments that included contaminated soil risk assessments, the types of risk assessments that are conducted for combustion

10:04 sources. So, for example, cement kiln or an incinerator. There were risk assessments for projects where there might be deposition of materials on farmlands and the question was whether or not those -- depositions of those metals, for example,

10:04 would be taken up in material for cows or, you know, some farm animal.

Those are some of the things that I can recall at the moment.

Q Okay. And I think my question was, did you

10:05 have a particular subspecialty?

A No particular subspecialty that I'm aware of as I started.

Q You talked about some of the different projects that ETI worked on as a firm while you were

10:05 there just now.

A Yes.

Q And you mentioned risk assessments on contaminated soils.

When you were at ETI, did you work on any risk assessments related to contaminated soils?

A Yes.

Q Tell me about those.

MR. STALPES: Objection; broad.

THE WITNESS: In what way are you asking your question?

BY MS. STEVENSON:

Q Sure.

At what sites did you work on risk assessments for contaminated soils?

A Boy, I can't recall specific sites offhand.

Q What were the soils that you worked on -- what contaminants were you conducting a risk assessment for?

A In general, they would be metals and solvents and polychlorinated compounds. I think that kind of covers the major group. Air contaminants.

Q What are air contaminants?

A I'll give you an example, like benzene, polyaromatic hydrocarbons would be a general category.

Q VOCs?
A VOCs would be, semi-VOCs.
Q Can you recall any risk assessment that you worked on that was related to the evaluation of metals in the soils during your time at ETI?
A Well, I can remember that I -- metals were common in almost every risk assessment that I conducted. But specifically which ones, I don't recall.
Q Can you recall working on any project during your time at ETI that related to potential arsenic contamination in soils?
A Well, arsenic was almost always part of the risk assessment, whether it would have been soil or -- I'm thinking, for example, with cement kilns, those would always be -- arsenic would always be part of those risk assessments. I can't think of an example where it would not be included.
Q Okay. And when you say it's part of the risk assessment, that doesn't mean that it's the driver of the risk assessment.
Is that fair to say?
A It depended on the issue, yes. It could be and it could not be.
Q Can you recall any risk assessment that you

worked on during your time at ETI where arsenic was the driver of the risk assessment?

A I can't recall anything offhand.

Q And you worked at ETI from looks like 1992 through 1995.

Is that fair to say?

A Yes.

Q And at some point there you had a position, vice-president marketing and communications.

Do you see that?

A I do.

Q And that was from 1993 to 1995?

A Yes.

Q What did that position entail?

A Well, it was a small firm, so sometimes the scientists had other tasks to do to keep -- from the business perspective, in order to maintain business functions. And I apparently was successful in articulating issues related to toxicology; for example, providing what we called risk communication activities and, therefore, I believe because of my skill over time that was something that I was offered.

MR. STALPES: And I don't mean to interrupt, but you said '93 to '95 is the marketing communications.

Is that -- maybe I'm just missing it. I didn't see that here.

MS. STEVENSON: That was my question. It says 1993, but he was there until 1995.

10:09 Q Do you recall the time period you had the position of marketing and communications?

A Well, it looks like it's only one year. It was a short period.

Q And I would assume in that position you also had responsibility for marketing the firm to potential clients.

Is that fair to say?

A Well, marketing -- I think the answer is yes, but it's not I don't think particularly clear what that particular firm did in terms of marketing.

Marketing at that time, as I recall, would include things like publishing papers, providing -- helping people publish papers in the firm, helping produce materials for the firm that could be distributed if -- upon request from a client, kind of review what are the pieces of information that might be useful to provide a good understanding of what the firm's capabilities are.

Q Marketing materials, right?

A Well, I'm not a marketer per se, just a

scientist, so --

Q And then you became the president of Environmental Toxicology in 1993 and kept that position until 1995?

10:11 A That's correct.

Q How did you become the president of Environmental Toxicology?

A I'm not quite sure how I became, but I was offered the position and I decided to accept that

10:11 position.

Q Who was the president before you?

A Well, at the time there was some transition in the firm. At one time there was a woman by the name of Katherine Kelly who I believe started the

10:11 firm. Then -- and I don't recall exactly the dates, but ETI was -- not sure if the word "acquired" is the right word, but if you take that from a conceptual basis, a larger firm entered into an agreement with the owners of ETI to become part of a larger firm,

10:12 and it's during that period of time I became president.

Q What was that larger firm?

A The larger firm was ERM is the acronym, and I believe they are out of Pennsylvania.

10:12 Q And ERM acquired ETI; is that right?

A Well, I don't really know the specifics of what the terms of art are in that transaction. I was not an owner, so I wasn't privy to it.

Q Did you -- did ERM acquire or become involved with ETI before -- while you were still there?

A Yes.

Q And so when you were the president of ETI, ETI had some relationship with ERM.

Is that fair to say?

A Yes.

Q But you are not clear on what that relationship was?

A Well, it became clear as time moved on. ERM became the owner and ETI was incorporated in some way. Whether it's part of the whole organization or some other business arrangement, that I can't -- I don't recall.

Q Okay. And where did Ms. Kelly go? Did she leave ETI?

A She did leave ETI.

Q Where did she go?

A She -- I believe she's in Nevada at that point.

Q Do you know where she went at the time she

left?

A There was a transition, as I recall, from ETI to a firm where she and I worked together for a period of time, and then she moved on to Nevada.

10:14 Q What firm was that?

A It's Intertox.

Q Okay. So were you working for Intertox at the same time you were working for ETI?

A No.

10:14 Q Did Ms. Kelly start the firm Intertox?

A No.

Q Who started the firm Intertox?

A I did.

Q When did that happen?

10:14 A In 1995.

Q And what did Ms. Kelly do from 1993 to 1995?

A You would have to ask her.

Q You don't know?

A Well, she was, during that period of time,

10:14 part of ETI to some degree, but you would have to ask her specifics.

Q Was there anything else that contributed to the change in management of ETI when you became the president?

10:14 MR. STALPES: Objection; foundation.

THE WITNESS: I'm not sure I follow your question.
BY MS. STEVENSON:
Q Sure.
10:14 Were there any other reasons why you took over management from Ms. Kelly at ETI --
MR. STALPES: Same objection.
BY MS. STEVENSON:
Q -- in 1993?
10:15 A Again, the best of my recollection was that the ERM management -- and again, I don't remember the specifics so I will just --
My best recollection is with ERM, and whoever else, provided me the opportunity to leave 10:15 ETI at that time.
Q And why did you leave ETI to start Intertox?
A I had an opportunity to start a business and one where my professional goals and interests and philosophy allowed me to practice as an independent 10:16 toxicologist in a way that other organizations, at least from my limited, did not allow me to practice?
Q And were there specific goals or things you wanted to do in your toxicology practice that you had not been able to do at ETI?
10:16 A I'm not sure how to exactly answer that

question. Could you rephrase that, please?

Q Sure.

I mean, you just said you wanted to start this new Intertox business because it was going to allow you to practice as an independent toxicologist in the way that you felt you wanted to practice toxicology; is that right?

A Yes.

Q And so what were the ways that you were able to do that that you say you had not been able to do it at ETI?

A Well, I think, for example, the questions that I was asked in this particular case was to say, you know, look at this risk assessment, provide an independent expert opinion on it, which I did.

Q Is that something you would not have been able to do at ETI?

A I think the answer is no on that, but under a larger management structure, when it became part of a larger organization, I think it became not -- it just became a little bit more structured in a way that I didn't really understand, never having been part of a big organization before.

Q You preferred the flexibility of working at a smaller company.

Is that what you are saying?

A I much prefer the flexibility at a smaller company, and I -- I find it less bureaucratic. Let's put it that way.

10:18 Q When you were the president of ETI, did you have responsibilities other than simply doing the science?

A Yes.

Q What kind of responsibilities?

10:18 A Well, it would be for the overall organization of the company. I think traditional roles of the president of an organization. It was mixed with continuing to conduct work, as well practicing my craft.

10:18 Q How much time percentagewise would you say you spent on actually doing scientific work versus management and other responsibilities when you were the president of ETI?

A I don't recall exactly, but I believe

10:19 that -- I mean, with only 14 people or whatever it was at the time, ten people or eight people, it's a relatively small management group to deal with. So most of the time was practicing.

Q All right. And in 1995, you started

10:19 Intertox; is that right?

A Yes.
Q Okay. And you have worked at Intertox consistently since 1995?
A I have.
10:19 Q You have two companies under here, Intertox, Inc. and Intertox Decision Sciences.
Do you see that?
A Yes.
Q Well, why don't you first tell me what 10:19 Intertox is.
A Intertox is a toxicology and research consulting -- let me restate that.
It's a toxicology consulting and research organization.
10:20 Q How many people work at Intertox?
A I think as of today, I have eight to ten people.
Q And has that been true since you started Intertox in 1995?
10:20 A What part is true?
Q That eight to ten people on staff?
A No. It's grown, it's contracted for various reasons.
Q When you started Intertox, how many people 10:20 did you have?

A I think I had three at the time.
Q And were you one of those?
A Yes.
Q Okay. And Ms. Kelly?
10:20 A Ms. Kelly for a period of time.
Q And who was the third?
A I don't recall her name. But kind of a staff person that conducted kind of spreadsheets and did research, literature searches.
10:21 Q And what is the largest number of people you've ever had at Intertox?
A I'm not quite sure. It might be 15, maybe 16.
Q Would it be accurate to say that between 10:21 1995 and today, Intertox has varied between three and 16 employees over time?
A What was your date period?
Q 1995 to today.
A Yes.
10:21 Q Now, what is Intertox Decision Sciences?
A So Intertox Decision Sciences is a company that basically takes -- produces -- doesn't produce. It acquires scientific content, places it in databases, and that that scientific content is then 10:22 available for clients. And the type of data are data

related predominantly to risk assessment.

Q And is it focused on any particular type of contaminant?

A Its current focuses are on materials that are called -- that are what we call nano sized. So it's related to nanotechnology.

Q Does the database have any data on arsenic?

A Not that I can recall.

Q What about other metals?

A I'm sure that it does have other information, as many of the materials use catalysts to produce it, like nickel and cadmium for sure.

Q Is it data that is focused on nanomaterials as used in products?

A It has a wide range, yeah.

Q Does any of it focus on nanomaterials as they would relate to environmental contamination?

A The -- in a general sense, the answer is going to be yes.

Q And what does that mean? I mean, do nanomaterials contaminate the environment in a way that, say, metals could?

A Yes.

Q How so?

A If a material, a product -- let me just say

if this paper cup had a nanomaterial and then you put it into a garbage can and then it goes to a landfill, that then potentially could contaminate soil or water or something like that. So that -- that's how you get it, which would be similar to all risk assessment.

Q Okay. Do you consider nanomaterials to be a specialty of yours?

A It's certainly one area that I have a good understanding.

Q Other than ETI and Intertox, have you worked for any other organization since you received your -- well, let me --

Setting aside your teaching positions, other than ETI and Intertox, have you worked for any other organization since you received your PhD in 1992?

A The way that -- the answer's yes.

Q And what organizations have you worked for?

A So from time to time, I've been asked to perform certain tasks. So for example, the U.S. EPA has me as one of their -- and I don't recall exactly what it is. It may be in my CV here -- part of their external review of certain toxicological issues. And in that way, as I recall, I get a, at the end of the year when I do those, something like a 1099 or I get

something that it's not Intertox that's been hired, it's me that's been hired. So things along that line.

But those are, you know, one time or -- I mean, it's repeated maybe from one year to another year. And I believe I'm still on -- I believe I'm still on the EPA -- I'm available and I believe I've got all of the paperwork in for the EPA on this issue. But that's my recollection.

10:26 Q Any other organizations that you can recall now along those lines?

A I don't recall one but they would tend to be organizations that are nonprofit or governmental, to the best of my recollection.

10:26 Q Talk about your teaching positions.

You have on your resume that you have been an adjunct professor, University of Nebraska Medical Center from 1999 to the present; is that right?

A Yes.

10:26 Q And at the University of Nebraska Center for Environmental Toxicology from 2002 to the present; is that right?

A Yes.

Q How many courses have you taught at

10:27 University of Nebraska in either of those

departments?

A I haven't taught any courses. I've given lectures.

Q How many lectures have you given?

10:27 A I think somewhere around -- roughly somewhere between five and ten is my best recollection.

Q Between 1999 and the present?

A Yes.

10:27 Q And have those --

Have the topics of those lectures varied or have they been focused on one topic?

A They vary.

Q Have you given any lectures on risk

10:27 assessment?

A I gave a lecture on risk assessment, the general principles of it, yes.

Q Any others on risk assessment?

A Can you be more -- can you rephrase that?

10:28 I'm not quite sure I followed.

Q Yeah. Besides the one lecture on the general principles of risk assessment, have you given any other lectures on risk assessment at University of Nebraska?

10:28 A Not that I can recall.

Q Have you given any lectures at University of Nebraska on metals?
A Yes.
Q Which metals?
10:28 A All of the heavy metals and others, as well in a general -- in a course -- in a lecture, excuse me.
Q Have you given any lectures on arsenic?
A Arsenic was included in that.
10:28 Q How many lectures did you give on heavy metals?
A I don't recall.
Q Can you recall the subject matter of any of the lectures that you gave on heavy metals?
10:28 A The subject matter?
Q Yes.
A For example, if you are asking did I talk about mercury, arsenic, lead, or is there something else you are looking --
10:29 Q Or in what context were you talking about, toxicity or sampling protocols or --
A Okay. Mostly it was related to what we would call the toxicokinetics, the pharmacology, although that's more toxicology in this case. It
10:29 would include information about outcomes,

symptomatology, speciation of metals and how they influence toxicity. Those would be the general types of information I provided.

Q Are there any lectures that you've given in your work as an associate professor at University of Nebraska that you think inform any of your opinions that you are giving in this case?

A No.

Let me just make sure I understood your question. If what you are asking me is if there's anything in that coursework that somehow I'm bringing to this particular work as we sit here today, is that what you are asking?

Q Yes.

A No.

Q Let's look at your specific project work that you have listed on pages A-3 through A-13 of your CV.

Does this list of your project experience omit any significant projects that you've worked on?

A Well, I'm not quite sure what you mean by "significant projects." It is a -- it's certainly selected projects. Your interpretation of what might be significant and mine might be different, so I don't mean to mislead you on that.

Q What was your basis for choosing to list a project on here?

A I think in general the way that I approached it was to provide, I think, a couple of things.

One would be to demonstrate expertise in both toxicology and risk assessment for a number of different environmental toxicants, whether they be metals or air pollutants. Excuse me. Air pollutants, volatile organic compounds, et cetera.

Another purpose was to demonstrate experience with what we call exposure pathways, meaning how could a human become exposed to it.

Another reason I can recall would be to demonstrate my familiarity with both federal and, in some cases, state regulatory understanding in risk assessment.

Those are some of the ways. Those are some of the reasons that I chose the examples that are in my CV.

MR. STALPES: Shannon, we've been going about an hour. Do you mind if we take five and refill on water and whatnot?

MS. STEVENSON: No. Sounds good.

THE VIDEOGRAPHER: Going off the record. The time now is approximately 10:33 a.m.

(Off the record.)

THE VIDEOGRAPHER: Going back on the record. The time now is approximately 10:46 a.m.

BY MS. STEVENSON:

10:45 Q Dr. Pleus, continuing to look at your CV that's in front of you, looking at the "Select Project Experience" section, your first section you have there called "Air," and what do you mean by projects related to air?

10:45 A This would be an example of projects -- or these would be examples of projects where somehow the contaminant of concern was in air for a significant component. Doesn't exclude other pathways, but that would be one way.

10:46 Q Okay. Let me have you -- let's see.

On the first page there under "Air," your first project is "Assessed human health risk of workers in a facility that was being built to decommission chemical warfare agents."

10:46 Do you see that?

A I do.

Q And if you look down to the second to last bullet, there's a description there that looks very similar.

10:46 Is that the same project?

A It is.
Q Okay.
A I think it is. Just let me just double-check.
10:46 Q Sure.
A Yes, that one looks to be the same, although that project did have two components to it.
Q That's just an inadvertent repetition?
A That would be my guess.
10:47 Q Okay. In this section I notice that you have listed a lot of projects related to cement plants; is that right?
A I do believe that there are a number of those. Whether they predominate, I'm not quite sure.
10:47 Q Right.
And in those descriptions, for instance, if you look at the third project listed under "Air," it mentions chemicals of concern including metals and then it says including arsenic and other metals.
10:47 Do you see that?
A I do.
Q For the cement plant projects that you have worked on, has arsenic ever been the primary contaminant of concern?
10:48 A It's been an important contaminant of

concern.

Maybe I'm not quite sure I follow your question. Could you just either repeat it or rephrase that, please.

10:48 Q Sure.

In your work on different cement plants, has arsenic ever been the primary contaminant of concern?

A And do you mean by "primary" -- can you define it, please?

10:48 Q The most significant contaminant that you are looking at with respect to that project.

A And when you mean "the most significant," I'm just trying to understand --

Q Sure.

10:48 A -- are you saying the only contaminant?

Q No.

A Could you explain a little bit better, please.

Q How about this: Have you worked on any

10:48 cement facilities where arsenic was the driving factor, for instance, in a risk assessment?

A I don't recall whether in any one of the many cases that I looked at. I do know that it was assessed in -- I can't think of an exclusion where

10:49 arsenic was not assessed, let's put it that way.

Q Is it fair to say that in approaching projects as a toxicologist, there are often a number of potential contaminants that you are looking at?

A It depends on the case. There are cases where there are up to 80 constituents of concern. There are some cases where it's one.

Q And when you have situations where you have, say, 80 constituents of concern, do some of those tend -- usually tend to become the more important constituents of concern?

A Can you rephrase that, please?

Q Sure.

When you have a situation where you are looking at 80 constituents of concern, do actions usually end up being taken based on a smaller number than 80 of the constituents?

A If what you are asking, let's say out of 80 are there several that become the most significant, sometimes we use the word driver of the risk. That number is generally a subset, a smaller subset of the entire number of chemicals that we would be looking at.

Q Was arsenic a driver of a risk assessment at any of the cement plants that you looked at or worked on?

A Again, I don't recall whether there was -- I don't recall.

Q Is there a constituent of concern that is usually the driver of risk assessments at cement plants?

A There are some constituents that are, as I recall in general, quote, unquote, drivers of risk assessment.

Q For cement plants?

A For cement plants, yeah.

Q What would those be?

A Well, some of the metals, arsenic being one of them, but other metals as well. And dioxins and furans as well, and there are a number of isomers as those. Get those as a general categories. I think some of the chlorinated hydrocarbons can also contribute.

Q As we sit here today, can you identify any cement kiln project that's listed in your CV where arsenic was the driver of a risk assessment?

A If I understand your question, is any cement kiln?

Q Correct.

A I can't point to one out of this list.

Q Do you know if there was one?

A I can't recall at this moment.

Q Have you flip to the next page, A-4, of your CV. About the middle of the page there, there's a project says, "Conducted a toxicological assessment of residents living nearby a lead smelting and refining operation."

Do you see that?

A I do.

Q What site was that?

10:53 A I'm trying to recall exactly, but I believe it's either one in Everett, Washington or one in Omaha, Nebraska.

Q Are those two different lead smelter sites that you have worked on?

10:53 A Yes.

Q When was the Everett, Nebraska project? Excuse me. Everett, Washington project?

A I believe it was in the mid '90s. Let me be a little more specific since -- I think it's

10:54 somewhere between '95 and '99. That's my best recollection.

Q And what about the project in Omaha, Nebraska?

A I believe it's the same period of time, but

10:54 I don't recall exactly.

Q Were you the primary person from Intertox that worked on those sites?

A Yes, I believe so.

Q And did you conduct a toxicological assessment for residents living near each of those smelter sites?

A The term risk assessment might be a little different for each of the cases in that one was more specific questions, as I recall, and the other was a human health risk assessment.

Q Do you remember which one was the human health risk assessment?

A The Omaha.

Q And what were the drivers of the constituents of concern that you addressed in that risk assessment?

A My recollection is lead and arsenic.

Q And do you recall which one of those, if either, ended up being the driver of that risk assessment?

A I don't, although I know both were evaluated concurrently. I think of the two, lead may have been a stronger driver, but the end points are different and their calculations, as you know, are different.

Q Who hired you to perform the human health

risk assessment in Omaha?

A It was a law firm.

Q This was related to litigation?

A Yes.

10:56 Q And who was the law firm representing?

A It was representing, as I recall, the plaintiffs.

Q Do you recall the name of that case?

A I don't.

10:56 Q Do you recall who the defendants were?

A The defendant -- I don't recall all of them, but I believe the facility was an ASARCO facility, if that answers your question.

Q An ASARCO lead smelter?

10:56 A I don't recall the details of that.

Q So this was a litigation project.

Is that fair to say?

A Correct.

Q Did you prepare an expert report in that

10:57 case?

A I assume I did, but I don't recall.

Q Do you recall whether you had your deposition taken in that case?

A That's what I'm trying to recall and it's

10:57 been a while and I don't recall.

Q Where was the case filed?
A Not positive, but maybe Nebraska.
Q And do you recall the general nature of the opinions that you gave in that case?
10:57 A Can you be more specific?
Q Sure.
Did you give opinions in that case that plaintiffs were exposed to contamination?
A Yes.
10:57 Q And what contaminants were they exposed to, in your opinion, that you gave?
A Lead and arsenic.
Q And did you make any recommendations with respect to that exposure in that case?
10:58 A What do you mean by "recommendations"?
Q Did you make any recommendations as to what the remedy plaintiffs should receive should be?
A I don't recall.
Q Was there an EPA risk assessment that had --
10:58 human health risk assessment that had been done in that case?
A I don't believe that that's the case. But again, it's been a while.
Q Did you evaluate exposure to arsenic in
10:58 residential soils in that case?

A Residential soils was one of the components of it, yes.
Q Do you recall the other components?
A Air, other pathways, as I recall.
10:58 Q Was the smelter operating?
A I don't recall if it was operating at the time, but I believe it may have been.
Q Okay.
A I do recall looking at air data. This is
10:59 very -- and if it wasn't operating, it was very shortly after it but it could very well be operating.
Q Do you recall the law firm that you worked for in that case?
A The law firm that asked me to conduct my
10:59 investigation is a law firm by the name of Riddell, Williams.
Q Are they in Nebraska?
A No.
Q Where are they?
10:59 A Seattle.
Q All right. Let me have you, if you look on page A-5, roughly the -- about the same distance down the page, fourth bullet down, there is a project description there I think is identical to the one we
10:59 were just looking at, "Conducted a toxicological

assessment to residents living nearby a lead smelting and refining operation."

A Yes, I see that.

Q Do you know if that's the same project or a different project?

A Well, as I mentioned there's two, and the wording is very similar. But I think it refers to at least one -- one or the other.

Q So let's talk about the Everett, Washington smelter.

Who operated that smelter?

A As I recall -- when you say "who operated," it's the same question you asked me earlier?

Q I don't know what you are referring to.

Who was the operator of the smelter in Everett, Washington?

A The company that operated it?

Q Yes.

A My best recollection was that it's ASARCO.

Q That's true for Omaha and for Everett?

A Yes.

Q And it was a lead smelter; is that right?

A To the best of my recollection.

Q And was the Everett, Washington matter also a litigation matter?

A It was.
Q Was that case filed in the State of Washington?
A Yes.
11:01 Q And did you work for the plaintiffs in that case as well?
A The plaintiff was the attorney general for the State of Washington, as I recall.
Q And what were the nature of the claims in 11:01 the case?
A I don't recall specifically, but I believe it had to do with the discovery of soil and contaminants related to the operation. And this facility was not operating, as I recall right now.
11:02 Q I assume discovery of contaminants in the soil?
A Close to or near the site.
Q And were you hired by the attorney general in that case?
11:02 A Yes.
Q And what work did you do for that case?
A Well, as it says, I looked at exposures, exposure pathways, toxicology, laboratory data to whatever I was provided.
11:02 Q And lead and arsenic were constituents of

concern?

A They were --

Q And --

A -- to the best of my recollection.

Q Did one of those end up being the driver of your risk assessment?

A I don't recall on that one.

Q Do you recall what opinions you gave in that case?

A Not specifically I don't, no.

Q Did you evaluate exposure to lead and arsenic through residential soil in that case?

A I believe so, but I'm not -- I believe that that's -- that would be the case, yes. But I don't recall the specifics of it.

Q Do you recall whether you gave an opinion that residents were exposed to lead and arsenic through their residential soil?

A Yes.

Q You did give that opinion?

A To the best of my recollection. I don't recall -- I think -- let me make sure I'm understanding your question.

Your first question was a certain thing and then your question you are saying specifically soils

and people. In every risk assessment that I conduct has to do with some human population and some exposure. So would soils have been a part of that, if that's what you are asking, part of that risk assessment, the answer's yes, of course it would be part of that risk assessment. And that's what I'm answering.

Q Was soil considered to be -- residential soil considered to be a dominant pathway for that risk assessment?

A It would certainly be a significant pathway. Whether it's the dominant, I can't recall.

Q And do you recall any specific investigation that you did with respect to exposures from residential soil in that case?

A Can you be more specific, please?

Q Sure.

Did you do soil sampling, did you review soil sampling, did you do any biomonitoring? What did you do to evaluate whether there was exposure to lead and arsenic through residential soils in that case?

A So this was a risk assessment. And so data were provided to me and a risk assessment was -- using the standard approach to risk assessment was

conducted as opposed to a biomonitoring study or whatever else you mentioned.

Q And is that the same for the Omaha, Nebraska work that you did?

11:05 MR. STALPES: Objection; vague.

THE WITNESS: I just want to make sure I'm answering your question. Could you just rephrase your whole question for the Omaha, Nebraska one?

BY MS. STEVENSON:

11:05 Q Sure. Let me ask a slightly different question.

Going to the Omaha, Nebraska project, was exposure to residential soils a dominant pathway that you considered in that project?

11:05 A Well, I don't recall exactly, but the -- it was certainly a significant pathway. Whether it was dominant or not, I cannot recall.

Q And on the Omaha, Nebraska project, data were provided to you; is that correct?

11:05 A Yes.

Q Did you do any data collection yourself?

A By "data collection," can you be more specific?

Q Soil sampling, air sampling, biomonitoring?

11:06 A I did not do that.

Q And as I understand it, you in the Everett, Washington case received data and using that data, you conducted a risk assessment under EPA guidelines.

Is that accurate?

A That's overall accurate. In other words, I conducted an assessment using the risk assessment approach, the standard approach to risk assessment, yes.

Q And is that the same in the Omaha, Nebraska case?

A Yes. I would follow the same guidelines.

Q And do you recall the outcome of the Omaha, Nebraska case?

A Could you be more specific?

Q Yes.

Did the case settle, did it go to trial, who won?

A I don't know the answer to that question.

Q And what about the Everett, Washington case?

A I believe there was some settlement at some point, but I wouldn't have been involved with that. But that's my best recollection.

Q Did you acquire any experience specific to arsenic in your work on either the Omaha, Nebraska case or the Everett, Washington case?

MR. STALPES: Objection; vague.

THE WITNESS: Can you be more specific? What acquired knowledge?

BY MS. STEVENSON:

11:07 Q Sure.

Is there any knowledge that you acquired about arsenic in working on those matters that would be relevant to your expert opinion that you are giving in this case?

11:07 MR. STALPES: Same objection.

THE WITNESS: It sounds similar to the questions you were asking me before. In other words, is there something particular that I'm pulling out of that case that's relevant to the questions that I was

11:08 asked in this case.

Am I understanding you correctly?

BY MS. STEVENSON:

Q Yes.

A Nothing specific, but the general process

11:08 is similar, the issues have similarity. They are not exact, but they have similarities. The approach is EPA approach. Those things are similar, but there's nothing that I could pick out and say, aha, that influences or provided sufficient information in this

11:08 case or what I was asked in this case.

Q Have you look at page A-10 of your CV. You have a section here related to soil?

A Yes.

Q And it has two projects listed under it. Is that fair to say?

What do you mean by the description "Soil"?

A Well, in these cases, the predominant -- let me go back and say, the purpose was to again demonstrate areas where a particular case had a focus and so these cases would provide evidence of that. That doesn't exclude what I said about air. In other words, soil may be contaminated by a combustion source and soil would be evaluated. But these are cases where the focus was on the contamination of soil.

Q Other than the two cases that you've listed here, are there any other cases that you've worked on where you would say soil was the primary focus?

A Soil has always been an important pathway, and so much of the examples in the "Air" would add to that.

Q Are there any other cases besides the two that you've listed under "Soil" that you worked on where soil would be the primary focus?

A There are other cases that we -- that I

have worked on, but they don't provide any particular unique component. Whereas my impression was that these provide some unique component of it because of the one case, arsenic and chrome (VI) were constituents of concern, and the other one was a wood-treating facility where other compounds would be concerned in addition to metals.

Q Can you identify for me any specific projects that you've worked on where soil was the primary focus other than the two you've listed here?

MR. STALPES: Objection; asked and answered.

THE WITNESS: Well, for example, the cement kiln projects would all have soil.

BY MS. STEVENSON:

Q Did any of them have soil as a primary focus?

A Can you be more specific?

Q Was there any one where the bulk of your work or investigation related to exposure to constituents of concern via soil?

A Were there other ones? Yes. Incinerators would be another example.

Q And I'm asking you about specific projects. What I want to know is are there any specific projects that you have not included within this

"Soil" section where soil was the primary focus of your investigation?

A Yes. I see your question.

There are some, but I have not listed them and I don't recall offhand.

Q Let's talk about the two that you have listed.

The first one is "Conducted field research on workers in wood treatment facilities to copper chromium arsenate."

Where was this project?

A I think, the best of my recollection is it was nationwide, although that's a bit broad. There were facilities, as I recall, in different states in the U.S. where the -- where these practices were occurring.

Q Who did you work for on this project?

A I recall that it was --

Can you be more specific?

Q Who hired you to do this work?

A I don't recall exactly the name, but I think it's a forest products research organization.

Q Is that a nonprofit organization?

A I don't know.

Q Was it a manufacturer?

A They themselves, I don't believe, were manufacturers. But the facilities that we visited obviously would have been manufacturers.

Q Were they an industry organization?

11:14 A They could have been. I just don't recall.

Q What time period was this project?

A I believe it was somewhere in the range of 1997 to maybe 2003, that period of time.

Q Were you the primary person from Intertox

11:14 that worked on this project?

A I -- no, I had others working on this.

Q Do you recall how much time you personally spent working on this project?

A I don't.

11:14 Q Could you say whether it was more than half or less than half of the total time that Intertox spent working on the project?

A I'm sorry. I can't. I don't recall.

Q In looking at the description, this is

11:15 talking about exposures that workers might receive to CCA.

Is that fair to say?

A Yes.

Q And it talks about airborne exposures.

11:15 Do you see that?

A I do.

Q And it talks about "Route of exposure was primarily via inhalation."

Do you see that?

11:15 A Yes.

Q What was the soil component of this project?

A One of the soil components was the material would leach or run off of the treated wood products where the material was stored, and those grounds 11:15 became contaminated.

Q And those were grounds at the work site, I mean, at the facilities, the wood treatment facility?

A They generally were at the facility, yes, 11:16 like in a yard or in some land close to the treating facility, including the treating -- you know, the ground in the treating facility as well.

Q Was this project litigation related?

A No.

11:16 Q Do you recall why you were asked to do this investigation?

A I think the organization that hired us was interested in understanding what risks there were to their facilities and to potentially their workers. 11:16 And others I think that, if I recall, resided close

to the facility, so like neighbors.

Q What was the final work product that you delivered in this case?

A I don't actually recall what that is.

11:17 Q Do you recall whether you found the workers were or were not exposed to arsenic in this case?

A Well, when you use the word "exposed," I want to make sure I understand what you mean by "exposed." Can you be more -- a little more clear?

11:17 Q Did you evaluate whether or not workers were exposed to arsenic in this case?

A In other words, did they come in contact with the metal?

Q Yes.

11:17 A Yes, of course.

Q And what was your --

And your conclusion was that they were exposed?

A Yes, the workers.

11:17 Q And do you recall whether you gave an opinion about the nature of that exposure?

A I'm sure I did. I don't recall it.

Q Do you recall whether you gave an opinion that the workers were subject to any health risks

11:17 from their arsenic exposure?

A I don't recall in this particular case exactly what the work product was, so I don't know what the questions were that were being asked. But I do believe that that would have been an important question to be at least reflecting on.

Q Do you recall that the route of exposure was primarily via inhalation?

A To the workers?

Q Yes.

A It's one pathway.

Q I mean, in the description it says "Route of exposure was primarily via inhalation."

A Primarily, but there were other pathways.

Q Do you recall inhalation was the primary pathway?

A It's what I wrote and I assume that that was the major pathway for the workers, yes.

Q And do you recall what the source of the constituents of concern that were being inhaled, what was the source that they were coming from?

MR. STALPES: Objection; vague.

THE WITNESS: Could you rephrase that? I want to make sure I understand your question.

BY MS. STEVENSON:

Q Sure.

You say here that the route of exposure to these constituents was primarily via inhalation, correct?

A That's what I wrote, yes.

11:19 Q The constituents that were being inhaled, where were they coming from, what was their source?

A It would be from the treatment of wood products or wood.

Q And was the --

11:19 Was it coming from the actual chemicals being used to treat the wood, you know, as they were being used in the treatment process?

A That would be part of it, yes.

Q Were they --

11:19 Was there inhalation coming from arsenic that had leached into the soil from the stored wood products?

A That, I don't recall. And I would have to go back to look at that, whether or not there were

11:20 sufficient -- if there was volatilization of materials. It's entirely possible that there might have been, yes.

Q Can you recall, as we sit here today, whether the constituents that were being inhaled

11:20 were coming primarily from their use in the facility

versus their leaching into the soil?

A Well, again, there was some multiple components, and I only address -- one of the reasons I present this in my CV is to help demonstrate certain attributes for a project. It doesn't include the whole project.

As I recall, there were other issues related to this project, related to residents that were living nearby as well, which would be another pathway to look at.

Q Do you recall whether the residents nearby were exposed, if there were concerns that they were exposed to arsenic?

A I believe that was one of the chemical -- the constituents of concern.

Q And were there concerns that residents nearby were exposed to arsenic in their residential soil?

A That, I'm not quite sure how, whether -- what the pathways were or how it migrated off. Might it have gone through some, you know, runoff like soil erosion or something like that. It's been a while since I've looked at that.

Q And you can't remember as we sit here today?

A I cannot.

Q Look at the other soil project that you have listed, "Comprehensive risk assessment addressing human health risks related to dioxins and PAHs in soil at a wood-treating facility."

Do you see that?

A I do.

Q Where was that project?

A What I recall is this project, and there were I believe two or three that would be represented by this. Here in the Pacific Northwest, which includes I think Washington and Oregon as locations, but I can at least think of a couple places in Washington where that might apply.

Q So you are not sure of the location for -- the particular location for this project?

A Let me -- maybe I wasn't clear in saying that there could be two or three projects that I can kind of recall that might apply to this particular bullet point, and I don't recall exactly where those would be other than I think one location is in the Pacific Northwest.

Q Okay. And do you recall who you worked for when you did the projects that are described by this bullet?

A One that I can recall was for a law firm.

Q So some of this work was litigation related?
A Well, the one that I'm recalling at the moment was.
Q And who did the law firm that you were working for represent?
A It represented, I believe, the owner and operator of the facility.
Q Do you recall who that was?
A The name of the owner?
Q Yes.
A I do not recall the name of the owner.
Q Do you recall the name of the law firm?
A Yes.
Q What was that?
A I say yes, and -- it's -- it will come to me in a second. One of the names is Gates.
Q K&L Gates?
A K&L Gates. Thank you.
Q And what time period did you work on these projects?
A I believe somewhere around the mid 2000s. That doesn't -- we're not even at our mid 2000s, sorry. Somewhere between 2000 and I believe 2007.
Q Okay. Were you the primary person at Intertox who worked on these projects?

A I was not the primary person, but I was involved. And under my direction.

Q Let me have you skip to page A- -- sorry.

Do you recall -- I take it arsenic was not an issue in this project.

Is that fair to say?

A To the best of my recollection, it was not.

Q Was exposure to constituents of concern through soil an issue?

A Yes.

Q And was it the primary issue in that case?

A When you say "primary issue," can you be more specific?

Q Was it the primary pathway you were assessing in that case?

A Well, it was certainly a significant pathway.

Q Do you recall what your ultimate opinions were in that case?

A No. It was a -- fairly complex issues that were being raised, so there was specifically requirements to answer questions that were raised, such as clean-up levels or something like that.

Q Had a lawsuit been filed by residents in that area?

A I do not know.
Q Did you give a deposition in that case?
A No.
Q Did you prepare an expert report?
11:26 A I believe we --
When you say "expert report," are you just saying in general?
Q I'm thinking of a litigation expert report like the one you did here.
11:26 A My recollection was that it wasn't litigation, per se. But it was related to the -- I mean, a law firm had asked us to conduct this assessment, but I don't recall it being specifically litigation.
11:27 Q Was it part of a regulatory process?
A That would be my guess.
Q I guess the work was submitted to U.S. EPA, so does that sound correct?
A That is correct.
11:27 Q Do you recall the conclusions that you reached in the work that you submitted to EPA in that case?
A No. As I mentioned, there were several questions that we needed to address, and I don't recall what those were specifically.

Q Looking at page A-12, under the "Ecological Receptors" section.

A Yes.

Q What do you mean by ecological receptors?

11:27 A In general, there are cases where we look at human health, but on occasion we will look at ecological receptors, which mean anything from kind of tertiary organisms or top of the food chain, if you will, organisms like a bald eagle or some 11:28 organism like that or deer that might be used for hunting -- that someone would hunt in order to get food to I think an occasion certain types of fish, things along that line. That's what I mean by ecological.

11:28 Q So it would be non-human receptors to potential exposure of contaminants?

A Yes.

Q If you look at the third bullet point under there, it says "Conducted toxicological assessment 11:28 for cleanup of lead and arsenic contaminated soil from smelter operating in the 1900s."

Do you see that?

A Yes.

Q Is that your work on this case?

11:29 A No.

Q What work is that?

A That -- well, actually, as I read it, that is in part work that I've done on this case. That's obviously clear. But I believe it also would fit to the questions in the state attorney general case as well.

Q The Everett, Washington case?

A Correct.

Q In that case, did you conduct historical toxicological research on articles and records dating back to the 1700s?

A Yes.

Q So you did that in that case, as well as this case?

A Correct.

Q And why is this project listed under "Ecological Receptors"?

A In part, because the questions that were being asked were related to farm animals and organisms related to other forms of consumptions, like hunting. And also the effect on the eco-receptors near facilities that were, you know, lead smelters, copper smelters, things along that line.

Q Looking to the project right below that,

"Conducted a toxicological assessment of human health risks from lead deposited in agricultural soil."

Do you see that? What project was that?

A This is a project that was related to a steel manufacturing plant, as I recall, in Texas, and that the emissions of the process of making steel was deposited on hay, as I recall. And if it's not hay, it's some other forage that is provided to cattle.

Q Was this a litigation matter?

A No.

Q Who were you hired by to do this work?

A My best recollection was the owners of the facility.

Q And did you provide a report in that matter?

A I don't recall.

Q When you say the owners of the facility, did you mean the owners of the steel manufacturing plant?

A Yes.

Q Do you recall what opinions, if any, you gave to the owner of the plant?

A I don't recall, but it was -- the purpose was to investigate the exposure pathway and whether that would lead to cattle. So it was a relatively specific question, whether the cattle -- how much would it take, for example, given the -- what is

understood about the toxicokinetics of the matter into those cows.

Q Do you recall whether you concluded that cows were exposed through that pathway?

11:33 A I'm sure I did, yes.

Q That they were exposed?

A Yes.

Q And did you --

Do you recall if you gave an opinion as to

11:33 the significance of that exposure?

A I believe I did.

Q What was that opinion?

A I don't recall.

Q Do you recall recommending any changes that

11:33 the steel manufacturing plant should make to reduce exposure to the cows?

A I don't believe we were asked to do that.

Q And do you recall any written work product that you produced in that matter?

11:33 A I don't recall. I'm assuming that that's what we did.

Q Were you the primary person from Intertox that worked on that matter?

A I believe I was a significant person in

11:33 reviewing the work, but I was -- I did not -- I

didn't do the calculations myself. I had someone else do that.

Q With respect to all of the projects that you've listed in your CV, I assume it's fair to say that you were not the primary person from Intertox who worked on these with respect to at least some of them.

Is that fair to say?

A Some of them I was what I would call the person that's responsible for the work to ensure the quality, make sure that the work was done correctly. But I would have others in the firm at my request conduct components of it. So I might ask someone to pull the algorithms together, set up a spreadsheet, things like that.

Q Are there projects listed on here in your project experience that you were not even the supervisor of?

A No.

Q Were you the primary person -- I apologize if I already asked this.

But were you the primary person who worked on the Everett, Washington matter?

A Can you be more specific?

Q Sure.

On your work related to the lead smelter in Everett, Washington, were you the primary person from Intertox that worked on that matter?

A Oh, yes.

11:35 Q And what about with respect to the lead smelter in Omaha, Nebraska?

A I was.

Q Let me ask you about the last bullet that you have listed under "Ecological Receptors." It says "Conducted human and ecological risk management from the effects copper slag leachates."

Do you see that?

A I do.

Q Where was this project?

11:36 A This project I believe was in Tacoma, Washington.

Q And approximately when did you work on this project?

A This was probably around the 1993, '94, '95 time period.

11:36 Q While you were at ETI?

A Yes.

Q Who did you work for or who hired ETI to do this work?

11:36 A The best of my recollection was a law firm.

Q Was it a litigation matter?
A Yes, I do believe that it was litigation.
Q Who did the law firm represent?
A I'm not positive, but I believe it may have been owners of the -- some owners or maybe a group of owners or a single owner in -- that was in the Tacoma Harbor area.
Q Owners of what?
A That's what I don't recall.
Q Were they the alleged polluters or were they people who were allegedly exposed to the pollution?
A That's a good question. They weren't the polluters, that I can recall. My best recollection was that they had received slag, that it was placed on their property and that that was the source of contamination. But again, that's been quite a while.
Q Were you the primary person at ETI that worked on this matter?
A No.
Q Who was?
A I believe it was -- I can't recall his last name. His first name is Gary Pascoe.
Q How much work did you do on this project?
A I don't recall the amount of work.
Q And sorry. Do you recall the law firm that

was involved in this matter?

A Not specifically. I have a guess, but I think it's a guess.

Q Okay. What is your guess?

11:38 A Lane Powell.

Q Is that a Seattle firm?

A I know they have an office here in town.

Q Do you recall whether ETI prepared an expert report in this matter?

11:39 A I'm assuming so, but I don't recall.

Q Do you recall what ETI -- any opinions that ETI had as a result of its work on this matter?

A I don't.

Q Going down to -- actually, let me ask you this.

11:39 Of the projects listed in your "Select Project Experience," are there any that you would describe where you obtained significant experience related to arsenic?

11:39 MR. STALPES: Objection; broad and vague.

THE WITNESS: Can you be -- can you rephrase the question? I'm not sure I follow.

BY MS. STEVENSON:

Q Sure.

11:40 I mean, if you were going to convince a jury

that you had expertise on arsenic, are there any particular projects that are listed in this "Select Project Experience" that you would point to to demonstrate your experience with arsenic?

11:40 MR. STALPES: Object to the form.

THE WITNESS: If I understand your question correctly, are there projects in here that provide experience in conducting risk assessment and risk assessment with arsenic? I think there's many, many 11:40 that do that.

BY MS. STEVENSON:

Q Okay. Are there any specific ones you would point to as -- well, let me ask a slightly different question.

11:40 If you were going to choose the three projects on here that focused most specifically on risk assessment related to arsenic, which ones would they be?

MR. STALPES: Object to the form.

11:41 THE WITNESS: Well, if what you are asking is which of these provide a significant source of information on arsenic, outside of all of my other approaches to gathering knowledge on this, you know, there's -- I can't recall how many risk assessments 11:41 that I've done for cement kilns or combustion

sources, but, you know, 20 or 30 or 40, something like that. Maybe even more than that.

There are cases resulting in wood treatment that some of those have -- again several of those would have arsenic as a component of the risk assessment. You know, I could put the two cases that you asked me about with Omaha and ASARCO, that would be an example of a third group.

So I'm -- not specific cases but groups of cases.

BY MS. STEVENSON:

Q Any others?

A Those are the three that -- those are the three that I have, that I can -- three groups that I can think of.

Q Is there any project listed in your select project experience here where arsenic was the primary constituent of concern?

A I can't recall. I mean, sometimes there was one or two and arsenic was one of the two. But I can't recall, as I sit here at the moment. But there may have been one or two.

Q Are there any cases listed in your "Select Project Experience" where arsenic was the primary driver of a risk assessment?

A Again, I can't recall as I sit here.
Q Are there any projects on here where you evaluated bioavailability of arsenic?
A I think every risk assessment bioavailability was reviewed and addressed and assessed.
Q Is there any specific project you can point to where you spent a significant amount of time or effort evaluating bioavailability of arsenic?
A Well, again, any of the risk assessments that included arsenic has bioavailability components to it, so those would be reviewed and assessed and, you know, again that could be anywhere from, you know, 30-plus cases.
Q Can you recall any project that's listed here on your "Select Project Experience" where you did not use a default value for bioavailability of arsenic?
A I don't recall.
Q Is there any project listed in your "Select Project Experience" that specifically concerned exposure to arsenic through residential soils?
A I'm going to ask you to repeat that. I didn't quite follow that.
Q Sure.

Are there any projects listed in your "Select Project Experience" that specifically concerned exposure to arsenic through residential soils?

A Through residential soils. I believe the two cases that are in relation to Everett and Omaha, I believe then by the risk assessment process the cement facilities and incineration facilities would include receptors that would be residential as well, so there's quite a number of them.

Q Is there any project listed in your "Select Project Experience" where the primary focus of the investigation was exposure to arsenic through residential soils?

A I don't recall that there's one that is specific to residential soils, but I evaluated the pathways in the cases that I've just described.

Q Just return to your -- under "Ecological Receptors," page A-12 --

A Okay.

Q -- that third bullet that I think you said concerns some of the work that you did for this case; is that right?

A Correct.

Q I think you said that you had conducted

historical toxicological research on articles and records dating back to the 1700s for the Everett, Washington case as well; is that true?

A That's what I recall.

11:47 Q Did you produce an expert report on those issues?

A I don't recall if I was asked to produce a -- sorry. I'm sorry.

When he says one-minute warning, I --

11:47 MS. STEVENSON: Why don't we take a break.

THE VIDEOGRAPHER: Going off the record. The time now is approximately 11:47 a.m. This is the end of disk number 1 in the deposition of Richard Pleus.

(Off the record.)

11:59 THE VIDEOGRAPHER: Going back on the record. The time now is approximately 12:00 p.m. This is the beginning of disk number 2 in the deposition of Richard Pleus.

BY MS. STEVENSON:

12:00 Q Dr. Pleus, continuing to look at your CV that is Exhibit 3 in this case, there is a section called "Expert Peer Review Panels."

Do you see that on page A-13?

A Yes.

12:00 Q Are any of these panels that you've listed

here focused on arsenic?

A I believe -- I don't believe that any of them are focused on arsenic; however, it's possible that the EPA ad hoc science review might have asked questions related to arsenic, but I just don't recall.

Q Okay. This is the Federal Insecticide, Fungicide and Rodenticide Act Scientific Advisory Panel?

A Yes.

Q Do you recall personally participating in any work related to that board on arsenic?

A I don't recall at the moment. I think most of it was focused on another metal, but I don't want to exclude the possibility that that didn't happen.

Q Okay. Have you served on any expert peer-review panels that are not listed here that have focused on arsenic?

A No.

Q Looking down at the next section of your resume, "Conferences and Symposiums," do you see that?

A Yes.

Q Did any of these conferences or symposiums that you listed here focus on arsenic?

A No.

Q Have you participated in any conferences or symposiums not listed here that focused on arsenic?

A No.

12:02 Q You list some educational courses next on page A-14.

Are these courses that you taught or attended?

A These are courses that I provided

12:02 presentations.

Q You were the presenter?

A Let me double-check, but I think that's right.

Yes, I presented in these cases -- in these

12:02 courses.

Q Did any of these courses focus on arsenic?

A They didn't necessarily focus on, but some of these courses did have arsenic as a component.

Q Okay. Can you point to any of them that

12:03 specifically had arsenic as a component?

A The lecture for the Department of Pharmacology, University of Nebraska Medical Center, courses in human health risk assessment for the Technical Research Council in South Africa,

12:03 developed -- I'm just reading this, developed and

taught over five courses on risk assessment and risk communication for the AWMA. That would include -- and then the last one is likely to have included arsenic as well, but not the main focus.

12:03 Q Did any of them have arsenic as the main focus?

A No.

Q Have you taught any courses not listed here where arsenic was the main focus?

12:03 A No.

Q The next section, "Grants and Awards."

Have you received any grants or awards specifically related to work on arsenic?

A No.

12:04 Q Looking at your advisory positions on page A-16, do any of these advisory positions concern advising regarding arsenic?

A I don't recall exactly, but it's possible that one or two would not be focused on arsenic but

12:05 would -- but arsenic would be a component of the advisory approach.

Q Can you tell me which those are?

A Some of those that are related to water and water treatment where arsenic may be a contaminant of

12:06 concern would be one area where I could anticipate

that.

Q Can you think of any specific advice you've given regarding arsenic in the course of your work in any of these advisory positions?

12:06 A No.

Q Skip to your "Selected Professional Presentations," pages A-17 through A-27, quite a few professional presentations.

Did any of these presentations focus on

12:06 arsenic?

A I'm going to ask you to repeat the question so I have it now fresh in my mind.

(The record was read as follows:

"QUESTION: "Did any of these

12:10 presentations focus on arsenic?")

THE WITNESS: None focused specifically on arsenic.

BY MS. STEVENSON:

Q Are there any presentations that you've

12:10 given that are not listed here that focused on arsenic?

A None that I can recall.

Q Looking at page A-27, your "Selected Professional Publications," are any of these --

12:10 You know what a peer-reviewed publication

is?

A Yes.

Q What is a peer-reviewed publication?

A It's a publication -- it's a manuscript that has been developed by authors that is submitted to a journal and that journal undergoes some type of a peer-review process.

Q And does that mean that the article is reviewed by other experts in the same field?

A That's generally what it infers, yes.

Q Is whether or not an article is peer reviewed something that's significant to you as a scientist in evaluating its usefulness?

MR. STALPES: Objection; speculation and vague.

THE WITNESS: When you mean "usefulness," can you be a little more specific?

BY MS. STEVENSON:

Q Well, what does it mean to you as a scientist, when looking at publications, whether a publication is peer reviewed or not?

Does it have any significance to you?

A It can.

Q When would it have significance to you?

A Well, it can have significance if the peer review was conducted in a way to assure that

the quality of the work was done well. I mean, that is certainly the intent of peer review. At times it doesn't meet that standard.

So its usefulness is really based on the manuscript itself, the data that are supporting the manuscript. That's when it's most useful.

Q Does the peer-review process provide some additional guarantees of the reliability of the study?

MR. STALPES: Objection; broad and speculation.

THE WITNESS: Professionally, I wish that was true. I have just run into a number of cases where the data don't support what the authors are stating; however, in general, the peer-review process at least is a step forward, but it is not a guarantee.

BY MS. STEVENSON:

Q Do you have any peer-reviewed publications that you've published yourself?

A Just in general?

Q Yes.

A Yes.

Q Are they listed in your "Selected Professional Publications"?

A Yes, they are.

Q Can you tell me which ones they are?

A The ISO/PTDR 13014.
Q That's the first one listed?
MR. STALPES: Maybe I missed the question.
Are you just asking him what his
12:13 publications are?
MS. STEVENSON: I'm asking which of his
publications are peer reviewed.
MR. STALPES: I see. Okay.
THE WITNESS: So that one.
12:13 BY MS. STEVENSON:
Q That's on nanotechnologies?
A Uh-huh.
The next one, Bruce.
Q Is that the second one listed?
12:13 A Correct.
The -- following Bruce, although the Snyder,
S. one before it is a document that went under peer
review but is not in a peer-reviewed publication,
if you get my point.
12:14 Q Yes. Did it pass the peer review?
A Yes.
The next Bruce is still being developed.
The Belzer was peer reviewed. The Snyder S.A.,
similar to the one above, it is part of a grant that
12:14 has a group of peer reviewers that are part of the

process, but it's not in a peer-reviewed publication.

The next one, Linkov is. The next one, Snyder S.A. is. The next Snyder E.M., I believe is. The next one Chow is. The next one Wahlsten is. The next one Greer is. The next one, Pleus, Goodman and Mattie, I can't recall but it's -- the CIPA is not a peer-reviewed journal, I'm sure of that. Abstracts, the next one, Greer M.A., I believe that was at a presentation and the abstract was reviewed but it wouldn't be a peer-reviewed manuscript, per se. Bylund is. Shiue, that's S-h-i-u-e, C. is.

The next one is a -- I don't believe was, but it was in a collection of papers at a meeting. The next one Pleus, as I recall, is but I'm not positive.

Q Health effects?

A Yeah.

Shirai, S-h-i-r-a-i, I can't recall. It looks like it's in a book. And it may be a chapter in a book and it may have gone peer review, but I can't recall.

The next one Pleus is. The next one Pleus, Suder and Schmidt is a presentation at a meeting and so I would say no. I can't recall. I would doubt that Pleus and Pascoe was peer reviewed, but it may

have been. The next one Shiue and Shiue I believe is. The next one Shiue and Bai is. The next one Pleus, Shreve, Towes is. The next one Shiue, Shiue is.

12:18 The next one is an abstract, so it would -- it may have gone some peer review, but it's still just an abstract. And then Pleus and Bylund is. And I believe Oatman and Pleus and Gray in Minnesota Medicine, I believe -- it's been a while since I've looked at that but I can't recall whether that is peer reviewed or not. I'm assuming it is, but I may be wrong.

Q Do you have any peer-reviewed publications that focus on arsenic?

12:18 A No.

Q Do you have any non-peer reviewed publications that focus on arsenic?

A Well, the risk assessments that I've been responding to your questions would have components of arsenic toxicology.

12:19 Q But those aren't publications, though, are they? That's your actual work product?

A Maybe I don't understand what you mean by "publications."

12:19 Q Well, let's look at the publications that

you've listed in your professional publications.

These don't include risk assessments, do they, what you listed here under "Selected Professional Publications"?

12:19 A I think actually some of them may go under the risk assessment; in other words, if you were -- sometimes articles have key words, and a key word in some of these would be risk assessment.

Q Would a key word in any of these be arsenic?

12:20 A No, I don't think so.

Q And then on the last two pages, you have contributions to book chapters and some other professional publications.

Do you see that?

12:20 A I do.

Q Is the focus of any of these book chapters or professional publications arsenic?

A In Borak and Pleus, which is a -- in the Textbook of Practical Approach to Occupational Health and Medicine -- Environmental Medicine, that may have information on arsenic.

Q Okay. Do you know whether it does or not?

A I can't recall.

Q How would you describe in general your area

12:21 of expertise?

A What my areas of expertise are, is that what you are asking?
Q Yes.
A In toxicology or --
12:21 Q Yes.
A --specifically?
General toxicology, pharmacology, risk assessment. I have further training in the nervous system, reproductive system and developmental system.
12:22 Those would be some examples.
Q What is a developmental system?
A What is that?
Q Yes.
A Like fetal development.
12:22 Q Is it specific to fetal development or is that one example?
A I'm not sure I follow your question.
Q You said developmental system. Is that a body system?
12:22 A I'm not sure -- maybe we -- maybe I need to hear your question over again.
Q You listed as one of your areas of expertise developmental system.
A Yeah.
12:22 Q Did I hear that right?

A Yeah. What developmental means is how organisms develop. So one example would be from conception to birth, we call that development.

Q Okay.

12:23 A So that's an area that I have expertise in.

Q And are there other --

Does that also include like general growth issues for humans or is it specific -- is your area of expertise just with fetal development?

12:23 A I see. It covers the whole life system, but one area as evidence, for example, by my dissertation title. If you recall that, there was an exposure period particularly during pregnancy. So that's an area that I focused on. That's one area.

12:23 Q Have you ever designed an arsenic biomonitoring study?

A No.

Q Have you ever conducted an arsenic biomonitoring study?

12:23 A No.

Q Have you ever designed any study on the bioavailability of arsenic?

A No.

Q Have you ever designed a study on

12:24 bioavailability for any chemical?

A Yes.
Q Which one?
A Which one what?
Q Which chemical have you designed a bioavailability study for?
A Let me make sure I understand what you mean by bioavailability study as well.
Can you explain?
Q Sure.
Bioavailability is a concept that you address in your expert report in this matter; is that true?
A Yes.
Q And that means if a subject is exposed to a certain constituent, how much of that constituent is actually taken up by the body.
Is that a fair description of bioavailability?
A Okay. I just want to make sure I understand what you are saying.
Q Is that your understanding of bioavailability?
A It certainly captures the spirit of bioavailability.
Q So which chemicals have you designed

bioavailability studies for?

A One more question.

Q Sure.

A When you say design a study, can you be more specific as to what you mean by that?

Q I mean come up with all of the protocols that are going to govern a study that is intended to investigate the bioavailability of a particular chemical.

A Okay. Well, as you can imagine, there's a range of types of studies that could be done. But some of the studies that I have participated on are perchlorate, for example, where material was administered or voluntarily provided to volunteers in a dose. Another example would be worker studies where they are exposed to different compounds, environmental compounds, and we were measuring their exposure and considered some other end points.

Q Okay.

A Those would be examples.

Other examples would include in my pharmacology education and research experience where I provided medications or drugs or experimental drugs to animals and made an assessment within a fairly broad range of bioavailability.

Q And did you actually --
You had a role in designing each of these studies. Is that fair to say?
A Some more than others, yes.
12:26 Q Did you conduct any of these studies?
A What do you mean by "conduct"?
Q Did you actually administer the doses and collect the data and analyze the data?
A In some cases, yes.
12:26 Q Which ones?
A Certainly all of the pharmacology studies. Again, most of these studies have a number of people and so my -- my involvement might be more focused as to data collection, data evaluation, things along
12:27 that line. But perchlorate and I think the worker studies as well.
Q And was the perchlorate study where you provided perchlorate to volunteers, did you actually conduct that study?
12:27 A Did I personally give them the perchlorate? Is that what you are asking?
Q Well, did you participate in the part -- in the -- the study occurred, I assume?
A Yes.
12:27 Q Did you actually participate in either

administering the doses or collecting the data or analyzing the data?

A Yes.

Q Which part?

12:27 A I certainly assisted in analyzing the data. The collecting of the data was done by a clinician and the administration of the material was by a clinician.

Q Other than analyzing the data, did you have 12:28 any other role in that study?

A Protocol design.

Q Anything else?

A A lot. I mean, those are some of the simple things that I can remember. I had a fair degree of 12:28 involvement in those studies.

Q Are there any other general ways you were involved in those studies that you can describe for me?

A Besides data analysis, protocol development, 12:28 in part assisted in the QA/QC, making sure that the QA/QC person was provided the data so they could do that. Statistical analysis, ensuring that protocol was followed to the degree that I could, ensuring that all of the proper study protocols and designs 12:28 were administered as the protocol and ensure that --

along with the clinician, that we put no one in undue harm.

Q Were the results of this perchlorate study published?

A Yes.

Q Is it one of your articles that's referenced in here?

A Greer.

Q Greer?

A 2002.

Q And you talked about another study on worker exposure to different compounds?

A Yes.

Q What compounds were studied in that study?

A Well, I'm kind of recalling the best of my recollection at the moment. I think they were wood-processing types of occupations. I think we were definitely looking at exposure at that point.

I can't recall some of the other details at the moment.

Q What was your role in the study?

A I can't recall specifically, but I do know that I'm involved in protocol development for studies in our firm.

Q Were the results of the study published?

A They may have been.
Q You are not sure?
A I can't recall.
Q Were you an author of the study, a listed author?
A I don't recall.
Q And then you mentioned some pharmacological studies that you were involved in.
Were these all when you were pursuing your PhD?
A In part, and my post doc.
Q Were there any pharmacological studies that you were involved in after your post doc work?
A Some of the studies got published that were part of my work after I left my post doc, but I -- I've been involved in a couple of projects by faculty members who had been developing some compounds. It's under confidentiality where I assisted in the process of understanding bioavailability.
Q Any other published studies on bioavailability besides the Greer study?
A Well, I think many of the positron emission tomography studies have components of bioavailability as a part of it. We have to look at that to understand what doses to provide so that we get

representative detection. So many of the studies have components of bioavailability as well.

Q Were any of them actually focused on researching bioavailability?

12:32 A Well, all of them had to have some research in order to answer the questions of what could we expect if we gave a certain dose.

Q So as I'm understanding what you are saying, bioavailability was a component of some of the 12:32 studies.

What I'm asking was it the focus of the research question being addressed by any of the studies besides the Greer study?

A Let's put --

12:33 Maybe a different way to answer your question is that bioavailability by itself is just a component, but when one is looking for how the component -- how the drug or how the chemical works in the body, you want to look at a number of 12:33 components. So I don't think you -- I don't think it's, in our profession, fair to silo one component when it's an integral part of the toxicological evaluation, if you see what I'm trying to say.

Q Would bioavailability be a key word for any 12:33 of your published studies?

A No. I think because of just -- my answer in that it's a component. It might be useful for one person to know that differently, but they would be able to obtain the information from the study.

12:34 Q Have you ever designed a soil sampling program for EPA?

A A soil sampling program for EPA.

Can you be a little more specific in what you mean by that?

12:34 Q Sure.

Has EPA ever hired you to come up with a plan to sample soil in an area of concern?

A EPA has not hired myself or Intertox; however, we have worked with EPA on dozens of

12:34 occasions in developing a plan.

Q A soil sampling plan?

A A soil sampling plan, for example.

Q Can you give me a specific example of cases where you worked with EPA to develop a soil sampling

12:34 plan?

A I believe an example would be some of the wood treatment facilities. One, for example, that I can recall at the moment here in the State of Washington, I believe it was both EPA and Department

12:35 of Ecology, which would be State of Washington, where

we worked on developing or reviewing soil sampling plans.

Q Any other examples that come to mind?

A Not off the bat, but I know there are others.

Q Has EPA ever hired you to conduct a risk assessment at a site?

A EPA asked Intertox or myself to conduct a risk assessment?

Q Yes.

A Not that I recall. But again similarly, we've worked with them on risk assessment.

Q What about any state environmental agency. Has a state environmental agency hired you to conduct a risk assessment at a site?

A Yes.

Q And what state agency hired you?

A State of Washington.

Q Department of Ecology?

A That's one. Department of Transportation is another. Those are two that I can think of.

Q What is the site that you were hired by Department of Ecology for? What site did you do a risk assessment on?

A Well, for example, the one that I was just

referring to in terms of a wood treatment. The attorney general would be another -- I guess another department within the state for the work in Everett.

Did I answer your question?

12:37 Q Uh-huh.

Any other examples that you can think of for Department of Ecology in Washington hired you to conduct a risk assessment?

A I know we worked with many states, state 12:37 agencies, like the State of Minnesota, I think the State of Missouri, where we worked with them in developing protocols and guidelines for the risk assessment process, yeah.

Q And what about the Department of 12:37 Transportation, are there any other --

What site were you hired to do a risk assessment for the DOT?

A For the State's Department of Transportation? We were asked to take a look at 12:37 various pesticides and their use on roadways here in the State of Washington. So it would theoretically include the whole state.

Q Did you complete that risk assessment?

A Yes.

12:37 Q What year was that?

A I think it's ongoing, so I think we updated when requested, so it may be the last was last year.

Q Do you recall when your first risk assessment was produced in that matter?

12:38 A I don't recall.

Q This century, last century?

A Clearly this century.

Q I mean in the 2000s?

A Are you being facetious?

12:38 Q Before 2000, after 2000? Can you be that specific?

A I'm sorry. I can't tell if you were joking with me or not. So let's go back and I'll assume that your question is straightforward.

12:38 If you could repeat it, please.

Q It was straightforward.

Can you recall whether it was this century? And I mean, meaning the year 2000 or after, or before that?

12:38 A It was during -- since 2000.

Q Okay. Thank you.

Have you ever designed a groundwater sampling program for EPA?

A Again, I don't recall being hired by EPA

12:39 for groundwater but have been involved with EPA in

developing groundwater programs and other state agencies.

Q Talk about just your work in general. Why don't we say over the past ten years, what percentage of your personal work has been litigation related?

A Over the last ten? For the best of my recollection, it kind of depends on the year. Sometimes it's more, sometimes it's less. I think overall it's somewhere around 20 percent.

Q And how would you categorize the remaining 80 percent?

A Nonlitigation.

Q Is it regulatory, consulting to industry?

A It's a combination of those two, certainly. We have research grants so that we conduct work on that. That would be a third category from what you've just mentioned.

Q Say take for the last ten years, can you specify what percentage of your work has been on behalf of industries that are alleged to be the producers of some contaminant of concern?

MR. STALPES: Are you talking just with litigation? I assume so.

MS. STEVENSON: No, I'm not.

MR. STALPES: Okay.

THE WITNESS: Can you repeat that question?
BY MS. STEVENSON:
Q Sure.
Let's take, for example, you worked for industries, correct, in litigation and nonlitigation matters?
A Yes.
Q What are some of the industries that you've worked for?
A Cement industry, aviation industry, power industry, chemical industry. Those are some examples. Water industry, food industry, pharmaceutical industry.
Q And in general, when you are representing them, these are industries where they've been alleged to be the producer of some contaminant of concern.
Is that fair to say?
A No.
Q Which of those industries --
In the cement case, that would be true, correct?
A Well, I don't agree with the way that you are phrasing the question.
Q Okay.
A Some cases -- let's take the cement

industry, as an example, was to come up with a risk assessment process, a multi-pathway risk assessment process that would be -- that would follow the golden standard or the standard of risk assessment and ensure that the approach was consistent with usually not only federal standards but also consistent with state standards.

And so you have cement kilns that operate in different parts of our country, and so there is a requirement that the process be done and set up. That would be an example.

Q But in that case, the cement industry is undertaking this work because it is -- there are concerns that it is emitting things into the environment.

Is that fair to say?

A I think that's fair.

Q Can you estimate what percentage of your work over the past ten years has been on behalf of industry, like the industries that you just listed for me, versus on behalf of a government agency or private citizens?

A I don't know the actual number, but I can give you a guess.

Q Sure.

A I'm thinking somewhere between 50 and 60 percent.

Q And what percent would be on behalf of government agencies?

12:43 A Maybe 10 percent on average.

Q And what would the balance be?

A Litigation, research grants, associations. I don't know, then maybe industry goes from 60 to 50 or 40, or something like that.

12:44 Q Well, some of your litigation work would also be on behalf of industries.

Would that be fair to say?

A Yes.

Q Over the last ten years in your litigation

12:44 work, can you identify what percentage is on behalf of industries versus on behalf of private citizens or government entities?

A Again, I don't have a specific number, but I would say somewhere around 60 percent, you know, plus

12:45 or minus 10 percent would be where attorneys representing a company would ask for an independent review, and the other percentage would be attorneys that represent non-industry would ask for an independent review.

12:45 Q You have worked with industry clients that

are engaged with environmental state or federal agencies in preparing risk assessments.

Is that fair to say?

A Yes.

12:45 Q Have you ever conducted any studies that were funded by industry clients that were used to gather data to -- data that was to be used to facilitate a risk assessment process?

A Yes.

12:46 Q Can you give me an example of a time you've done that?

A Oh, the perchlorate Greer study would be an example.

Q And --

12:46 A In fact, we disclosed that on our publications.

Q Right.

Do you -- and have you done work like that on other occasions besides just for the perchlorate 12:46 industry?

A Yes.

Q What other industries or substances have you done that on?

A Well, we have a couple that are going to 12:46 be -- that are being developed right now that are for

state agencies.

Q What industry do those relate to?

A State agency.

Q No. What industry did those relate to or what substance is at issue?

A Oh, I'm -- what substances are those?

Q Yes. Is this work that you are doing on behalf of a particular industry?

A A state agency. It's work conducted by a state agency.

Q And is the state agency the potentially responsible party for alleged contamination?

A It's not exactly the type of case it is, but it has to do with a contaminant of concern and exposures to individuals. And so it's a risk assessment, to make an assessment of whether or not that that harm was -- that these individuals could have been harmed.

Q And what is the constituent of concern?

A They are nitrates and nitrites, and then a whole bunch of other compounds as well.

Q And what are the relevant state agencies?

A State of Washington, Department of Transportation.

Q And is the Department of Transportation

alleged to have exposed people to these nitrates or nitrites?

A The particular -- there is no case here, so I'm kind of -- I want to make sure I'm answering your question.

And contamination doesn't necessarily mean that the group that hired you is the cause of that. It could be that they were -- just happened to be in a situation where there was contamination and they didn't realize it until it was discovered, if you will.

Q Let me ask this: Where in this work that you are doing did these nitrates or nitrites, where are they alleged to have come from?

A From drinking water.

Q How did they get into the drinking water?

A It's a bit of a good question. It appears that their water systems were hooked to the environmental cooling system of the building.

Q And who -- was the building owned by the Department of Transportation?

A No.

Q Who was the building owned by?

A The owner of the building, I don't recall.

Q Why is Department of Transportation involved

in the case?

A Because they are renting space from the building.

Q Okay. So coming back to, for instance, the perchlorate situation. You were hired by members of the perchlorate --

Is there a perchlorate industry?

A There's a group called the Perchlorate Study Group.

Q And who are the members of that group?

A Currently they include Lockheed Martin, American Pacific Corporation, ATK and Aerojet.

Q And are these companies that are at least alleged to have contributed perchlorate into the environment?

A They are either users or manufacturers of perchlorate.

Q And you conducted scientific research on their behalf for them to use -- to work with EPA and regulatory agencies.

Is that fair to say?

A Yes. They did work with EPA and we did work with EPA.

Q And did they pay for that research, the companies themselves?

A Most of the funding was by industry. There were portions that were provided through a -- small portions that were provided by the grants, by the clinician, but most of it was by the industry.

Q Why did the industries want to fund the research?

MR. STALPES: Objection; foundation and speculation.

THE WITNESS: I don't -- I don't know the answer to that question. I do know what we did. I don't know the answer to your question.

BY MS. STEVENSON:

Q Do you have any understanding at all of why these industries would have wanted to fund research regarding perchlorate?

MR. STALPES: Objection; asked and answered, foundation, speculation.

THE WITNESS: Can you repeat your question, please.

BY MS. STEVENSON:

Q Do you have any idea why these industries would have wanted to fund research on perchlorate?

MR. STALPES: Same objections.

THE WITNESS: Well, there was a -- as I understand it, back in the '90s when this contaminant

was discovered, I believe, in groundwater but potentially soil as well, and the state and federal agencies became interested in it, the -- and then I don't -- I don't have a lot of detail, but data gaps existed for which data was filled. So animal studies was done, this study was done. I believe something like 13 animal studies were conducted in order to get an understanding of the toxicological database.

BY MS. STEVENSON:

12:53 Q In other words, they were trying to provide more data to evaluate perchlorate?

MR. STALPES: Objection; form.

THE WITNESS: Again I don't know what their intention was, but there was -- clearly there were data gaps that whoever the interested parties were at the time and the federal agencies and the state agencies decided, I believe together but I don't know exactly, to fill in data, provide data.

BY MS. STEVENSON:

12:53 Q And the industry funded the research to provide that data?

A It certainly provided funding. As I recall, the animal studies were funded, the Greer study was funded, but I don't know if all of that work was

12:53 funded by industry.

Q In your research that you did on perchlorate that was funded by these industries, did you believe that the industries were motivated to obtain biased data?

MR. STALPES: Objection; foundation, speculation.

THE WITNESS: I don't know what their intentions one way or the other. When -- all I can tell you is when I'm asked to conduct a study, I come in and we conduct it using either for risk assessment, the standard process, or if it's a study to develop information on behavior or outcomes or something like that in animals, the protocol is a standard well set, well designed as best as we can study.

BY MS. STEVENSON:

Q In the course of doing your research on perchlorate, did you ever see anything that suggested to you that the industries funding the studies attempted to manipulate the outcome of the studies in any way?

A All of the studies that I'm aware of, the studies were all done under good laboratory practice, GLP, so there's a level of independence through that process that is required in documentation. And I can answer it -- the question that way. I don't have any

other -- I don't have any understanding of intentions by one group or not.

Q And I'm just asking whether you ever saw --

Is there anything you could point to that ever suggested to you that any funder of your perchlorate research was attempting to bias or manipulate any of the data in the research?

A We, as Intertox and myself, have not been approached to do anything of the sort, other than to do the best independent analysis using the best scientific protocols.

Q Have you ever been approached by a client to try to bias or manipulate data?

A I think that's going to be confidential.

Q So you have?

A I don't feel like I can answer that question.

MR. STALPES: Fair enough.

I'll object, then, and it calls for confidential information.

This probably would get someone or another into trouble here. You can ask him about this case, but whatever he has probably will get somebody else into trouble.

BY MS. STEVENSON:

Q Do you consider yourself an expert on arsenic?

A I consider myself an expert on metals, and arsenic is one of those, yes.

12:57 Q You do consider yourself an expert on metals?

A Uh-huh.

MR. STALPES: Just for the record there, you just kind of nodded. That's a yes?

12:57 THE WITNESS: I'm sorry. Yes.

MS. STEVENSON: He's on video.

Q Do you consider yourself an expert on arsenic toxicity?

A Yes.

12:57 Q Is there anything that you believe qualifies you as an expert on arsenic and arsenic toxicity that we have not already talked about in your CV today?

A Yes.

Q What is that?

12:57 A All of the coursework that I've taken, the readings that I have done that are not in the CV, the projects that are not listed in the CV, the risk assessments that I've conducted. Those would add to that as well.

12:58 Q When you talk about your readings, have you

done -- and I'm going to take it outside of the context of your work on this case.

A Yes.

Q Before you started to work on this case, what reading have you done specific to arsenic?

MR. STALPES: Well, objection. That's probably pretty broad.

But go ahead.

THE WITNESS: I mean, I read journal articles. I read textbooks. I read information from authoritative bodies, such as ATSDR, EPA, WHO, organizations like that. I'm obviously generally interested in these types of questions on a global basis, so there's other organizations besides WHO. Arsenic is an interesting compound from a toxicological perspective, so I am interested and I keep up.

BY MS. STEVENSON:

Q You're familiar with Dr. Tsuji?

A Yes.

Q Have you reviewed her CV?

A I believe I looked at it. I didn't look at it in tremendous detail.

Q Would you agree that Dr. Tsuji is an expert regarding the toxicological effects of arsenic?

A I would assume so, yes.
Q Do you think that Dr. Tsuji has more experience with arsenic than you do?
A In what way would you be thinking of that?
12:59 Q In the course of her entire toxicological career and yours.
A I don't know how to evaluate that.
Q Okay. Would you agree that she has several peer-reviewed publications on arsenic specifically?
12:59 A She may. I've seen in her expert report she points to one or two articles that I recall.
Q Would you agree that she has worked on a number of sites where arsenic was the primary constituent of concern?
01:00 A Yes.
Q Would you agree that she has conducted biomonitoring studies related to arsenic?
A I'm certainly aware of some aspect of biomonitoring that she has participated in, yes.
01:00 Q Do you know anybody who has more expertise with respect to arsenic than Dr. Tsuji?
MR. STALPES: Object to the form.
THE WITNESS: I'm not quite sure how to answer that question because there's probably hundreds of
01:00 people that are.

BY MS. STEVENSON:

Q Is there anybody that comes to mind?

A I mean, I can't think of them, but it would be a matter of a minute or two to do a literature search to find any number of people.

Q Do you agree that Dr. Tsuji sits on the National Academy of Sciences committees that are specifically devoted to arsenic?

A I'm not aware.

Q Did Dr. Tsuji give any opinions in her report that you don't believe she was qualified to give?

MR. STALPES: I'm going to object. Overbroad.

If you have any specific things, maybe you should come up with the report and show it to him. I think that's an awful broad question.

THE WITNESS: Can you be more specific?

BY MS. STEVENSON:

Q Yes.

Dr. Tsuji gave a number of opinions in her report, correct?

MR. STALPES: I would object there that the disclosures speak for themselves.

THE WITNESS: I mean, I can recall that she's given some. But is there anything more specific that

you could point to?
BY MS. STEVENSON:
Q Sure.
You reviewed her report carefully, correct?
01:02 A Yes.
Q And you provided a rebuttal report to it?
A Yes.
Q In the course of reviewing her report, did you see her give any opinions that you didn't think
01:02 she was qualified to give?
MR. STALPES: And I'll make the same objection.
Go ahead, but this is a broad question.
THE WITNESS: So here's where I'm a little confused in your question. To give an opinion and
01:02 qualifications, to me are not necessarily synonymous or logical. She gave opinions. She's clearly qualified, but her opinions I don't agree with.
BY MS. STEVENSON:
Q Right.
01:02 But you don't dispute that she has the qualification to give the opinion?
MR. STALPES: I'm going to put another objection here that this calls for a legal conclusion, if that's what you are having him do, sit as the judge
01:03 here who's qualified to make opinions.

But go ahead.

THE WITNESS: Yeah. See, I'm not.

BY MS. STEVENSON:

Q I'm asking your opinion purely as a toxicologist.

A And I am -- I think there are a number of opinions that she has provided that I think are in error --

Q Right.

A -- to the science --

Q Correct.

A -- that don't provide an appropriate level of uncertainty on those things. And I disagree with those. So how she -- how -- what the rationale in many cases, it's very difficult to determine what she did in order to come to that opinion. So I can't really assess the idea of her qualifications to that opinion. That's where I cannot answer your question.

Q Do you think that Dr. Tsuji has the relevant expertise to opine on the protectiveness of the arsenic action level at the Anaconda smelter site?

I understand you disagree with her conclusions, but does she have the expertise?

A Again, this is where I'm confused by your question in that it's not transparent using the

information provided in her report to understand what it was that led her to her opinion. And with that, it's extremely difficult for me to make -- to answer your question. I cannot answer your question.

01:05 Q So you cannot give me an example of any opinion Dr. Tsuji has given that she was not qualified to give. I understand you disagree with the opinion itself or the way that she reached it, but there's no credential that you can point me to that she needs that she doesn't have in order to give opinions on this topic?

MR. STALPES: I'm going to object to the form. It's not only compound, it's suggestive and leading and --

01:05 MS. STEVENSON: I'm allowed to lead an adverse witness.

MR. STALPES: -- and mischaracterizes his testimony.

THE WITNESS: I don't know how to answer your 01:05 question given the way that you've stated it.

BY MS. STEVENSON:

Q Do you have any expertise relevant to this case that you think Dr. Tsuji does not have?

A Again, a question that's extremely 01:06 difficult, given what I've just been saying over and

over, is that it's not clear how or what information was provided to come to an opinion, which is really quite critical to make an evaluation of the opinion.

An example here would be -- potentially an example I think is on the bioavailability. I don't know what her experience has been, for example, in other agents and analyzing other agents, which again, if I look at my background, I have a diverse set of therapeutic agents as an example for which understanding absorption distribution becomes key. So I don't -- I can't make that evaluation. I don't have all of that information.

Q Nothing you can tell me sitting here today?

A Nothing that I can -- that I'm aware of. But I don't think I can answer your question as I sit here today.

Q Do you think that Dr. Tsuji has any expertise that is relevant to this case that you do not have?

A I can't think of anything.

MS. STEVENSON: Okay. Why don't we take a break for lunch. I'll be ready to start as soon as you guys want to start again.

MR. STALPES: Okay. Should we take 30 or 40?

MS. STEVENSON: Yeah, that's fine.

MR. STALPES: Off the record.

THE VIDEOGRAPHER: Going off the record. The time now is approximately 1:08 p.m.

(Lunch taken.)

01:53 THE VIDEOGRAPHER: Going back on the record. The time now is approximately 1:54 p.m.

BY MS. STEVENSON:

Q Dr. Pleus, when were you first retained to work on this case?

01:53 A I'm not exactly sure, but I believe about maybe a year ago, roughly speaking.

Q Summer of 2012?

A That's my best recollection.

Q And who contacted you about the case?

01:54 A I believe it was Mr. Stalpes.

Q Had you ever known Mr. Stalpes before?

A No.

Q Had you ever done any work for the Beck, Amsden firm before?

01:54 A No.

Q What about the Lewis, Slovak firm, had you ever done any work for them?

A No.

Q Do you know how Mr. Stalpes came to contact you?

A Not really.
Q Did he have a referral from anybody you had worked for before?
A I don't know.
01:54 Q Prior to the time you were contacted by Mr. Stalpes, did you have any familiarity with the Anaconda smelter Superfund site?
A When you say "any contact," is that what you used?
01:55 Q Yes.
A Contact in the sense that I read about it in a general sense. You know, there's a number of papers and presentations at meetings, for example, where people that have worked at least in this
01:55 general vicinity have reported on it. So from that perspective, yes, I've had contact with it.
Q I think my question was -- and I might have misspoke, but what I think I might have asked is if you had any familiarity with it. But I think the
01:55 answer you gave would be the same?
A It would.
Q Did you ever actually work on the Anaconda smelter Superfund site outside of this litigation?
A No.
01:55 Q Have you ever participated in any studies

related to the Anaconda Superfund site outside of this litigation?

A Not that I'm aware of.

Q What was the assignment that you were given at the outset of your work on this case?

A So I was asked to review the CDM report, which is the Baseline Human Health Risk Assessment, to review that from a scientific perspective, to review it from a process perspective, meaning did it follow EPA guidelines for conducting this type of a risk assessment, to -- and then if appropriate, you know, dig deeper to try to understand what, if anything, was of concern regarding the conducting of the risk assessment, the process of the risk assessment or how it was -- or whether or not it followed the EPA standard guidelines.

Q And did you have an understanding of how your work related to the claims of the plaintiffs in the case?

A Not particularly. I mean, I understand that there are plaintiffs. I understand that there are -- they -- there are claims of some sort on contamination of their properties, but to what degree and, you know, what the import of that, per se, I've only been asked to look at the risk assessment side

of it and the toxicological perspective.

Q Prior to looking, -- and just for definitional purposes, the document you described that you reviewed, the Baseline Human Health Risk Assessment for the Anaconda smelter Superfund site, if I say HHRA, can we agree that we're talking about that document?

A Sure. That's the CDM, was it 1996 document?

Q Correct.

A Sure.

Q Before reviewing the HHRA as part of this litigation, had you had any familiarity with the regulatory record at the Anaconda Superfund site?

A I'm sure I may have had some familiarity because of other projects that I've worked on, and part of that is to, for example, look at the record of decision to try to understand if I'm on a project in place "X" what other ones have been conducted that might be or may or may not be similar. And so to that degree, I'm sure I've had some familiarity with it.

Q Can you recall any specific instances where you looked at the regulatory record from the Anaconda Superfund site prior to being involved in this litigation?

A I can't recall anything at the moment.
Q Would it be fair to say that your initial task in the case was to critique the HHRA?
A No, I think the initial task was to review that HHRA and determine whether or not that HHRA had followed standard guidelines. Then at that point, if there are concerns, more of a critique of it, what are the deficiencies, you know, what are the strengths, what are the weaknesses.
01:59 Q And that's what you ultimately ended up doing was a critique of the HHRA?
A Yes.
Q As you've mentioned, the HHRA was done by a company called CDM, right?
02:00 A Yes.
Q And did you understand that CDM was under contract to the EPA to do that work?
A That's what it stated in the document.
Q Is that, in your experience, is that uncommon for EPA to hire a contractor to conduct HHRA for Superfund site?
A I don't know specifically the answer to that question but I do know that EPA does hire contractors in a number of different areas.
02:00 Q Are all of the opinions that you intend to

give in this case included in your initial and rebuttal reports that you've submitted?

A As far as I know. I haven't been asked any other questions at this point. I don't really know what the process is, if someone asked me another question, but they certainly contain the information and my opinions as of today.

Q And I think you just answered this, but do you have plans to do any additional work on the case at this point in time?

A I don't have any plans to at this time.

Q How did you go about conducting your initial review of the HHRA?

A I read it.

Q And did you do anything else in the course of reading it?

A Such as?

Q Look at other documents, talk to anybody?

A I think the very first thing was to read it.

Q And what did you do after that?

A Then I started to ask questions to myself because it was, at a minimum, the first read, confusing.

Second impression that I can recall was that there seems to be missing information and I don't

mean -- I don't mean that there's -- there were things that pop up that I don't see how they were derived. That's what I mean by that more specifically.

02:02 So those are the next series of questions that I thought of.

Q And once you thought of those questions, what did you do next?

A Kind of reread it and checked it again and 02:02 found that those initial concerns could be refined and a list of tasks could be then developed.

Q And what were those tasks?

A Well, one was to pull together the studies that were referenced in the document.

02:03 Q Did you do that?

A Yes.

Another was to review certain sections of the document and then go back to EPA guidance, for example, and see how does EPA address this issue or 02:03 how does it require its -- these issues to be addressed. Those are some examples.

Q Did you ever talk to anyone who was involved in the preparation of the HHRA?

A I did not.

02:03 Q Did you talk to anyone from EPA about the

HHRA or the record of decision that the HHRA informed?

A No.

Q Did you review other expert reports prepared by experts in this case?

A Well, Dr. Tsuji, her reports.

Can you be more specific about experts in this case, what that means?

Q The plaintiffs have hired other experts to give opinions in this case, namely John Kane and Fredrick Quivik.

Did you review reports by either of those gentlemen?

A I believe I think it's Dr. Quivik. I think I read through his report once. Mr. Kane, I've seen data that had been developed, collected by Mr. Kane as well.

Q Did you review the expert report that was submitted by Mr. Kane in this litigation?

A I don't recall that I did, just the data.

Q And other than Dr. Tsuji, did you review the expert reports of any of the experts retained by Atlantic Richfield in this case? That would include Steve Larson, Kathy Johnson, Richard Bartelt.

A None of those names are familiar to me.

Q Can you think of any other expert report that was prepared as part of this case that you reviewed?

A I've seen like a memorandum. I believe it's from Atlantic Richfield or at least has a cover letter and describes some analysis that was done on the HHRA.

Q Is this a document that was prepared as part of this litigation or some other point in time?

A I understand that it has been, yes.

Q Can you give me any more details about this document?

A Not offhand, other than it was -- it talked -- went into some discussion about the bioavailability factor.

Q Can you recall who the author of the document was?

A Not offhand, I cannot.

MR. STALPES: Do you want me to help?

MS. STEVENSON: Yes, please.

MR. STALPES: These are those technical memorandums that were included in Dr. Tsuji's file which were the -- I think one was SRI elicited by Jim Kuypers, and in response, Arco retained another company.

Do you know which ones I'm talking about?

MS. STEVENSON: I do vaguely, yeah.

MR. STALPES: It's those.

MS. STEVENSON: Thanks.

02:06 Q In the course of your work on this case, have you interviewed any of the plaintiffs?

A No.

Q Have you communicated with them in any way?

A No.

02:07 Q Did you send any kind of surveys to the plaintiffs?

A No.

Q Did you ask their lawyers to send surveys to them on your behalf?

02:07 A No.

Q Did you speak to anyone else in the course of preparing your report about the substance of your report?

A To my staff.

02:07 Q Anybody besides your staff?

A And Mr. Stalpes.

Q Okay.

A And some of his colleagues. That's it.

(Deposition Exhibit 4 was

02:07 marked for identification and is

attached hereto.)

BY MS. STEVENSON:

Q Dr. Pleus, I'm handing you Exhibit 4, which I'm going to have to share with you. These are documents that you brought here today that I believe are invoices reflecting the time the people at Intertox have spent preparing your reports in this case.

Is that fair to say?

A Yes.

Q And do these invoices reflect all of the time that has been spent by Intertox on this matter?

A To the best of my knowledge, yes.

Q And I see a little adding machine strip there at the front. Does that reflect the total amount that Intertox has been paid on this matter?

A I'm assuming so. When I asked my financial person, accountant, to respond, this is typical of what she will do, so I'm assuming that that's what that is. I didn't double-check it myself.

Q I think that reflects approximately $130,000; is that right?

A That's correct.

Q And that's what's been paid to Intertox, to your knowledge?

A No, I don't know if that's been paid to Intertox. But that would be the sum of our invoices.

Q Okay. So you might have not received payment on all -- for that entire amount yet.

Is that fair to say?

A That's possible, yes.

Q There are a few different categories of individuals listed there, one of them is chief toxicologist.

Do you see that?

A Yes.

Q And are you a chief toxicologist?

A Yes.

Q Is all of the time that is billed to the category chief toxicologist in these invoices time that you personally spent working on the matter?

A Yes.

Q There's no other chief toxicologist at Intertox that would have recorded time?

A I'm just double-checking. The answer appears to be it's just me, it's just my time, yeah.

Q Who at Intertox besides yourself has worked on this matter?

A Individuals include the following: Gretchen Bruce, Lisa Corey, Kerry King, Gavin Bell, and

Heather Klintworth. I think those are all of the individuals that I can think of.

Q And what category, billing category is Gretchen Bruce?

A Gretchen is a senior toxicologist.

Q What about Lisa Corey?

A Lisa is a staff scientist.

Q And Kerry King?

A Librarian.

Q Gavin Bell?

A Project assistant.

Q And Heather Klintworth?

A Would be staff toxicologist as well.

Q Okay. Is there a staff toxicologist? I saw there's a senior toxicologist and I think you said a staff scientist.

A I'm sorry. Just let me double-check if there's differences between that. There is a staff scientist and then there is a staff toxicologist.

Q Okay. Which is Heather Klintworth?

A Staff scientist.

Q And do you know who among your team spent -- including yourself, spent the most amount of time in preparing the reports on this case?

A I think -- I'm sure Gretchen Bruce has spent

a fair amount of time on this case. I'm sure Kerry in terms of obtaining the documents has as well. I think they all have -- they've all spent time.

Q Do you think between yourself and Gretchen Bruce, she spent more time on the case in preparing the reports or you did?

A I don't know.

Q Were there any particular assignments related to the reports that you handed over to Gretchen?

A Well, there's a number of things that I did hand over to not only Gretchen but others, and that is historical kind of understanding of the EPA guidance and see if there's anything unique, literature search. I instructed Gretchen to investigate the bioavailability factor. I asked Kerry to obtain historical documents. Those are some examples I can think of.

Q Are there any portions of your report that you are not the principal author of?

A I am the principal author of the report.

Q Are there any sections that were primarily authored by someone else besides you?

A There are certain sections that people drafted and then I edited, but I become the

responsible person. It's my -- in the end, it's my work.

Q Did Gretchen Bruce draft the bioavailability section?

02:13 A She put together some portions of it, but her -- my request was more specific towards getting specific information on the study, the dosing and then, for example, conducting more of a historical -- or a literature search on that particular topic.

02:14 Q Did she draft some sections of the bioavailability section of the report?

A She put some paragraphs together, yes.

Q What about Lisa Corey, did she provide the initial draft of some sections of the report?

02:14 A Do you have a copy of my report? Maybe that will help.

Q I do.

(Deposition Exhibit 5 was marked for identification and is

02:15 attached hereto.)

THE WITNESS: I can't recall specifically but sections that I would normally have people help draft portions of would be just general risk assessment guidelines and history. Another thing that I would

02:15 have individuals do would be to pull together

spreadsheets and then put algorithms together. And that would be probably a combination of Heather and Lisa, for example. Lisa doing the -- more of the former risk assessment process. Gretchen could participate as well.

When it comes to the alternative exposure assumptions, I think those are where the data that's been derived in the first couple of sections are investigated and at that point, I will have discussions with individuals about that. They may then draft based on my discussions with them at least a point forward, but then I review it and edit it.

Q Are there any sections of your report that you are exclusively responsible for authoring yourself?

A Pretty much the whole thing.

Q Okay. Did you write the first draft of all sections of your report?

A I put together the outline. I put together the sections. I put together what I wanted in those sections, and I -- for the whole report, and then I drafted the summary and conclusions, the executive summary, in total.

Q And other folks filled in the remainder of the sections, at least with an initial draft.

Is that fair to say?

A Yeah. An initial draft is not -- it could be a paragraph here, a paragraph here and then I take those and develop them further.

02:17 Q Okay. Let's go to your report, then, in front of you there.

So it's my understanding that your initial report does two things. That it critiques EPA's HHRA.

02:17 Is that fair to say?

MR. STALPES: Object to the form.

THE WITNESS: I critique the HHRA.

BY MS. STEVENSON:

Q And that you then conduct a new HHRA.

02:18 Is that fair to say?

A I don't see it exactly that way. I think the first is review it, determine whether there are concerns about the process that the risk assessment underwent.

02:18 Second was to see if there is -- if there are information gaps or data gaps, if you will, in the report, in the risk assessment. And then basically it's appeared that when pathways were absent, in order to follow the standard approach, A, 02:19 address whether a pathway is present; and if they

are, conduct the risk assessment per guidelines. And that's what I did.

Q And those things were all related to a critique of the HHRA?

02:19 A In this case, yes. Those would be the components. I don't know if I have them all, but those are certainly some of the key ones.

Q And the other portion of your report you calculate a different what you call soil screening

02:19 level and you calculate that to be approximately 8 parts per million arsenic.

Is that fair to say?

A I think it's adjusted slightly to 9, 10. It's a number but it's not the -- it's not really the

02:19 purpose of the report to calculate a specific number. But it is to compare and contrast that to how the risk assessment should have been done had it followed traditional kind of gold standard EPA process.

Q Are you giving an opinion that the 250 parts

02:20 per million action level for arsenic in residential soils that was set by the EPA is incorrect?

A Can you explain to me what you mean by "incorrect"?

Q Sure.

02:20 Do you think that there should be a

different action level for the community?

A That's for regulatory agencies to make a determination. What I am saying is that, number one, the 250 is not explained in the HHRA. Number one.

02:20 Q That was an EPA decision. Fair to say?

A I have no idea.

Q You've reviewed the ROD for the community soils, haven't you?

A I have, but it is an information gap, from my perspective.

02:20 Q Okay. Is it fair to say that EPA selects action levels based on human health risk assessments as well as other information that the agency considers?

02:21 A Can you give me an example of the other?

Q I'm asking you, in your experience as a toxicologist, have you seen EPA at Superfund sites select action levels that are based on factors other than just a human health risk assessment?

02:21 A Are you -- I'm trying to understand your question.

Q Sure.

A Can you rephrase that just to make sure I understand?

02:21 Q Do you --

In your experience, when EPA chooses action levels for cleanup at Superfund sites, does it consider factors in addition to human health risk assessments?

A For clarification, could you give me an example?

Q I'm asking you if you can think of an example. Or if you know whether consideration of other factors is part of EPA's process?

A Certainly EPA considers other factors aside from the risk assessment, but it's clear that the risk assessment provides significant input to that process.

Q Are you --

And I think you just said you are not giving an opinion about what the action level at -- for a residential soils cleanup within the Anaconda Superfund site should be.

Is that fair to say?

MR. STALPES: And I'm going to object as vague. I don't know if you are saying what the EPA should have done. I don't know what you mean by that.

THE WITNESS: Can you rephrase the question, please, or repeat it.

BY MS. STEVENSON:

Q Sure.

Are you giving an opinion about what the action level for residential soils cleanup at the Anaconda Superfund site should be to protect human health?

A An agency comes up with its decisions and has many factors, and that's not what I've been asked to do.

Q Okay.

A But what I've been asked to do is whether or not this human health risk assessment has followed standard guidelines to come up with the values that it did, and the answer is no.

Q Are you giving an opinion in this case that any plaintiff in the case has suffered any health effects from exposure to arsenic in their residential soil?

A I haven't been asked that, to do that.

Q Are you giving an opinion that there is any environmental damage to any of plaintiffs' properties in this case?

A Can you give me an example what you mean by "environmental damage"?

Q Sure.

Areas where vegetation won't grow, for

instance.

A I haven't been asked to do that.

Q Do you have an opinion about whether the 250 part per million arsenic action level at the Anaconda smelter site is protective of human health for residents of Opportunity?

A If I understood your question, do I -- was I asked to develop opinion that the 250 was not protective of human health?

Q Correct.

A I wasn't asked that question.

Q I'm going to hand you Dr. Tsuji's report as well.

(Deposition Exhibit 6 was marked for identification and is attached hereto.)

BY MS. STEVENSON:

Q I'll direct you to page 2 of her report. Dr. Tsuji's first opinion that she gives is that residents of the community, and she defines community as the residents of Opportunity and Crackerville that are the plaintiffs in this case.

"Residents of the community are protected from health risks from exposure to metals related to the former mining and smelting operations by the EPA

Superfund RODs, which included involvement of the Agency for Toxic Substances and Disease Registry and state and local health authorities."

Do you either agree or disagree with that opinion?

A I don't know how that opinion was derived to make an evaluation.

Q Okay. So you don't have an opinion one way or the other?

A I would say that the process of demonstrating a human health risk assessment as it's requested and stated by the EPA guidelines was not followed and, therefore, it's -- one is not able to determine the answer to that question.

Q Do you have an opinion that any of the plaintiffs in this case are exposed to any actual health risks based on the arsenic concentrations that are present in their residential soil on their properties?

A Pretty much the same answer to that. Based on my review of the HHRA, which leaves out significant pathways, and some of the determinations that were made or decisions that were made that are absent in terms of support, including Dr. Tsuji's expert report and rebuttal that do not fill in those

information gaps, I can't determine that.

Q So just to make sure I understand. Your opinion is that you cannot determine whether there are any actual health risks to the plaintiffs in this case from arsenic concentrations in their residential soil.

Is that fair to say?

MR. STALPES: Object to the form and vague as well.

THE WITNESS: Can you repeat what I just said, please?

(The record was read as follows:

"ANSWER: Pretty much the same answer to that.

"Based on my review of the HHRA, which leaves out significant pathways, and some of the determinations that were made or decisions that were made that are absent in terms of support, including Dr. Tsuji's expert report and rebuttal that do not fill in those information gaps, I can't determine that.")

BY MS. STEVENSON:

Q So the answer is you can't determine whether

there are actual health risks or not.

Is that fair to say?

A Again, I wasn't asked to determine health risks. What I was asked was did this HHRA follow standard EPA guidelines and conduct a risk assessment which would then inform other processes depending on what the answer was.

Q Okay. And basically, I'm just trying to make sure that you are not going to get up at trial and say that the plaintiffs in this case have actual health risks from the arsenic concentrations on their property. I, Dr. Richard Pleus, have determined that.

Am I correct about that?

MR. STALPES: I'm going to object. The report speaks for itself. It talks about the cancer risk throughout. I don't know if you are trying to exclude him.

MS. STEVENSON: I'm asking Dr. Pleus if he's going to testify at trial that any plaintiff in this case is exposed to any actual health risk based on arsenic concentrations on their property.

THE WITNESS: Again, the process of a human health risk assessment is to -- there's several steps that go along, and this first one was is there an

indication that we have potential health risk or not. The answer is you don't know the answer to the question until it's done correctly and then follow-up actions occur.

02:29 What I'm saying here is that following standard guidelines, it wasn't done correctly. And so those later questions that you are alluding to, which I haven't been asked to follow, to conduct, can't be answered at this particular time, only 02:29 because the process isn't complete.

BY MS. STEVENSON:

Q Well, you redid the process. Is that fair to say? You calculated your own soil screening level?

02:30 A Yes, in the end I ended up coming up with a screening value but the -- the report does pretty much the same, as well. The CDM, the HHRA provides a table, for example, that's basically orphaned in the document, and listing risks of cancer according 02:30 to the guidelines that are, at this point, uninterpretable.

Q All right. But you have corrected those issues with your own version of the HHRA; is that correct?

02:30 A I've certainly followed EPA guidelines and

I -- if you followed them along the process using pretty much the same data that the HHRA used, I come up with answers that are different than what that HHRA did.

02:30 Q Do you think that exposure to arsenic above 8 parts per million in residential soil is a risk to human health?

A That's not the purpose of that value. It is the screening value that's the end of the

02:31 calculations. But value is only to demonstrate the discrepancy between what the EPA has stated, which is 250 based on this risk assessment, versus if you were to follow through with this risk assessment, even using the HHRA's own data, regardless if it's mine or

02:31 theirs, the values are largely different and unexplained.

Q Do you have any opinion about what soil arsenic concentration would be appropriate for this community, Opportunity and Crackerville, to

02:31 sufficiently protect human health?

A I wasn't asked to specifically do that. That would require more information also. I think that's pretty much a regulatory process that gets involved as well, and that's not what I was asked to

02:32 look at either.

Q And you are not giving an opinion on that?
MR. STALPES: I'm just going to object. I think he's confused by your questions. The report is pretty detailed in all of this.
02:32 MS. STEVENSON: I think the questions are pretty clear.
Q What additional information would you need to determine a safe action level for arsenic in residential soil in this community?
02:32 A Well, I would have to think about what that would be. But the first step is to conduct this level of risk assessment and, if it warrants further investigation, then to move on to the next phases.
Q You haven't told any plaintiff in this case
02:33 that their property is unsafe, have you?
A I haven't been asked to make that determination.
Q Is there a process by which people can provide comments to the EPA at active Superfund sites
02:33 that relate to the remedy that's been selected?
MR. STALPES: Objection; foundation.
THE WITNESS: I'm aware in general EPA has a process for allowing comments on a number of actions. I don't know whether it was specifically on this one
02:33 or not.

BY MS. STEVENSON:

Q Have you ever submitted comments to EPA when it's in the -- at an active Superfund site regarding a proposed remedy?

02:34 A I may have. I don't recall right now.

Q Have you brought any of the concerns that you raise in your expert report to the attention of the EPA?

A I haven't been asked to do that.

02:34 Q Do you think it would be important that EPA consider the concerns that you've raised in your expert report?

A I think the agency would be interested to understand how this HHRA is different from how its guidelines are.

02:34 Q And if you're -- the concerns that you raise were accepted by the EPA, they could change the remedy for the Anaconda smelter Superfund site.

Is that fair to say?

02:34 A They could.

MR. STALPES: Objection; speculation.

THE WITNESS: I don't know. They could possibly.

BY MS. STEVENSON:

02:35 Q Just to cover just a couple general

toxicological principles.

Would you agree with me that one of the fundamental principles of toxicology is that all things are poison under some exposure conditions but not under others?

A Are you paraphrasing Paracelsus? If so, that's not the correct paraphrase.

Q I actually just quoted this from one of your book chapters.

A I don't recall ever writing that.

Q Okay.

A Can you point to me where that is written?

Q Chapter 39 of toxicology at page 555.

A Sorry?

Q In the chapter of Practical Approach to Environmental Medicine.

MR. STALPES: You haven't brought that with you, have you?

MS. STEVENSON: I can probably pull it out if we need to.

THE WITNESS: I would be interested. I have a co-author in that.

BY MS. STEVENSON:

Q That's not a phrase that's familiar to you?

A It may be in that textbook, but that's not

the correct paraphrase of Paracelsus, which is what I was thinking you were referring to.

Q How would you paraphrase Paracelsus?

A All things are toxic. It depends on the dose. I mean, that's a simple way to put it.

Q The dose makes the poison?

A Yes.

Q And that means that certain chemicals can be toxic but only if they reach a certain dose.

Is that fair to say?

A Dose, exposure, yes. Frequency, things like that.

Q Do you agree with me that the detection of a chemical does not mean that toxicity will occur?

A I agree with that, especially if it's a low detection limit.

Q Right.

Would you agree with me that most chemicals have a dose threshold that must be met or exceeded before there's any adverse effect?

A In general, that's a correct toxicological principle.

Q Do you have an opinion as to whether that principle applies to arsenic?

A I think it depends on the species of arsenic

and what end points you are looking at.

Q What about for cancer?

A I think in general, the way that the risk assessment process looks as a probability of developing cancer. And so that's not a -- that's generally considered a more linear approach to that versus a threshold approach.

Q Do you have an understanding of the biological mechanism by which arsenic can cause cancer?

A I have some knowledge of it. The definitive, absolutely essential understood way that it is, I don't think it's been -- I'm not aware that it's been specifically determined to that degree.

Q What is your understanding?

A That as arsenic is -- enters the body and biotransformed, there are metabolites that can affect the -- either genetic or re- -- not reproductive, the protein production and transcription on a cellular basis.

Q Is that the only mechanism by which you understand that arsenic can cause cancer?

A It's certainly one of the ways that I'm familiar with. There may be others.

Q And are you aware of any current research on

that issue?

A I don't --

Do you have an example?

Q I'm just asking you.

02:39 A Nothing that I can recall at the moment.

Q You would agree with me that arsenic is a metal that occurs naturally in soil and water?

A It is a natural metal, yes.

Q Thanks.

02:39 And that the concentrations, for example, the arsenic occurs in soil very widely throughout the country?

A They do vary. I don't know what you mean by "widely" but they do vary.

02:40 Q And you've heard of naturally occurring substances referred to as background levels of that substance, for instance, in soil?

A Yes.

Q Do you have any opinion about what

02:40 background levels arsenic are in Montana?

A I've read a document by the State of Montana where it conducted an analysis, I think it was statewide, so not just the Anaconda/Opportunity area. And I think their 90th or 95th percentile was

02:40 40 milligrams per kilogram.

Q 40 parts per million?
A 40 parts per million.
Q Do you have any opinion at all whether anything needs to be done to the plaintiffs' properties in this case to make them safe for their use?
A Well, I go back to the -- my first point, and that is based on the HHRA, which omits pathways or analysis or certainly doesn't adequately explain why they're not included, that the answer to the question is more work needs to be done in order to make that assessment --
Q Okay.
A -- from a toxicological risk assessment perspective.
Q You are not suggesting by your report that their properties should be cleaned up to 8 parts per million arsenic?
A I wasn't asked to make that determination.
Q In your report, you calculate a soil screening level that you calculate to be approximately 8 parts per million which you've now revised to 9.7 parts per million.
Is that fair to say?
A Yes.

Q And what did you mean by soil screening level?

A Well, what I meant by it is again through the process for which the guidelines state, and that is if you conduct a baseline risk assessment, does the value at the end of that indicate that further analysis needs to be done or not.

Q Is that a process that is defined in some sort of EPA guidance?

A It's in many EPA documents. There's numerous ones.

MS. STEVENSON: Let's take a break. I remembered.

THE VIDEOGRAPHER: Going off the record. The time now is approximately 2:44 p.m. This is the end of disk number 2 in the deposition of Richard Pleus.

(Off the record.)

THE VIDEOGRAPHER: Going back on the record. The time now is approximately 2:55 p.m. This is the beginning of disk number 3 in the deposition of Richard Pleus.

(Deposition Exhibit 7 was marked for identification and is attached hereto.)

BY MS. STEVENSON:

Q Dr. Pleus, Exhibit 7 is the "EPA Soil Screening Guidance: User's Guide," and I believe you cite this several times in your report.

Is that accurate?

A Yes.

Q Now, is the soils screening number that you calculate in your report the type of soil screening number that's described in this guidance?

A Can you be more specific?

Q Sure.

This guidance gives you direction on calculating a soil screening level, correct?

A It does, yes.

Q It's to be used for certain purposes?

A Yes.

Q Is the soil screening level that you have developed in your report the same as the soil screening levels that are described in this guidance?

A Let me take a look.

MR. STALPES: I'll object looking at this document as vague. The document talks about different kinds of screening levels.

THE WITNESS: So is there more -- I've looked over the document. Is there more precise -- I'm not quite sure I follow your question just yet. This is,

you know, a number of pages.

Is there something that you can point to where your --

BY MS. STEVENSON:

02:58 Q Well, sure. For instance, you base your soil screening level on a target cancer risk rate of 1 times 10 to the minus 5.

Is that fair to say?

A Yes.

02:58 Q Did you get that number from this document?

A No.

Q Okay. Where did you get that number?

A That's a document -- there are several EPA documents that give a range from 1 times 10 to the

02:58 minus 6 to 1 times 10 to the minus for a general acceptable barrier.

Q How did you choose 1 times 10 to the minus 5 out of that range?

A Well, I think there is one other piece of

02:58 information, and that is that the State of Montana has a risk level for cancer set at 1 times 10 to the minus 5 as well. On one hand, 1 times 10 to the minus 6 provides a certain level of cancer risk and 1 times 10 to the minus 4 has a higher level of

02:59 cancer risk. The determination was a combination of

attempting to come up with the 250 parts per million and looking at what other guidance could provide a reasonable degree of risk level.

Q Did you rely on this document Exhibit 7 for anything in your report?

A Yes. It provides, again, general information as to approach. It gives information on how to conduct it. It provides limitations to -- I mean, procedures to determining how to calculate screening levels. So from that perspective, it's one of many documents that I've used.

Q And you would agree with me that the screening levels, soil screening levels described in this document are not intended to be cleanup standards.

Is that fair to say?

A I think if you are referring to some particular sentence in this document --

Q I'm looking at page 1.

A Okay.

Q It says "SSLs are not national cleanup standards" in bold.

Do you see that?

A I do.

Q So is it fair to say that this document is

not intended to provide guidance on establishing a clean-up level?

A I'm not quite sure that's accurate. I mean, even on page 3 it talks about "SSLs can be used as preliminary remediation goals," for example. I think it goes to the heart of the matter of determining whether there's an unacceptable risk to human health. And when you have a value that is, at least in this HHRA, that's what, 8 times -- my calculation is 8 times 10 to the minus 5th, which excludes the pathways, which would indicate that there's an unacceptable risk to human health, and it excludes pathways, I think it does raise that issue.

Q Do you understand a preliminary remediation goal to be the same thing as an action level, clean-up action level?

A It's not the same specifically, that's correct. But it says here it can be used as a PRG.

(Deposition Exhibit 8 was marked for identification and is attached hereto.)

BY MS. STEVENSON:

Q Handing what's been marked as Exhibit 8.

Is this a document that you considered in preparing your report?

A So I think the answer to your question is did I use -- did I use this particular memorandum in my evaluation of the work that I had done?

Q Yes.

03:06 A Much of this information is repeated in other documents that I have read. Whether I read this particular one or not, I don't recall. But there are -- this type of information is repeated in a number of documents.

03:06 Q Would you agree with me that this is EPA guidance on the "Role of the Baseline Risk Assessment and Superfund Remedy Selection Decisions"?

A That's the subject title.

Q And the first bullet there on page 1 says

03:06 "Where the cumulative carcinogenic site risk to an individual based on reasonable maximum exposure for both current and future land use is less than 10 to the minus 4 and the noncarcinogen hazard quotient is less than 1, action generally is not warranted unless

03:07 there are adverse environmental impacts," do you see?

A Yes. You read that correctly.

Q And does that mean that if the risk is less than 10 to the minus 4, no action is warranted? Is that your general understanding of that?

03:07 A Well, I don't --

MR. STALPES: Objection; mischaracterizes the document.

Go ahead.

THE WITNESS: Well, I think that there is several other pages where it goes into a broader discussion and -- of whether that's actually the case, and it does contradict much of the documentation that EPA also has out there on the approach to assessing cancer risk.

BY MS. STEVENSON:

Q Do you think that an excess cancer risk of 1 times 10 to the minus 4 is an unacceptable risk?

A I think that EPA has determined that as a border from which almost all risk assessments, when they start to come close to that value, either, one, checks for the completeness because it is raising the concern of an unacceptable cancer risk to that population.

Q And when you talk about -- let me just look at a page in your report here.

When you talk about excess cancer risk as calculated by a risk assessment, that's not calculating any actual risk to any actual person.

Is that fair to say?

A Are you looking at a particular page?

Q I'm just asking a question. I'm not quoting anything.

A This is a -- the risk assessment process and the baseline risk assessment process is one that looks at current and future uses of this property -- of land and determines using the guidelines whether or not there is an un- -- a cancer risk that is unacceptable and -- according to EPA guidance. That's what the risk assessment does.

Q But it's not a calculation of any actual risk to any actual person in the community.

Is that fair to say?

A Well, I think it actually represents a hypothetical individual where it can occur; otherwise, why would you go through that exercise. And, you know, at the 250, which is 8 times 10 to the minus 5, based on what my calculations are, that's pretty close and it excludes pathways. And so those individuals at 250 would be posed with an unacceptable cancer risk.

Q 8 times 10 to the minus 5 is an unacceptable cancer risk?

A Especially when you've not included certain pathways.

Q Assuming all pathways were included, is

8 times 10 to the minus 5 an unacceptable cancer risk?

A At least in my experience, it would be something that we would look at much more carefully because it is up against the 1 times 10 to the minus 4 cancer risk.

Q Are you aware of sites where EPA has approved remedies that have cancer risk above 1 times 10 to the minus 4?

A Yes.

Q And so at times EPA used that risk as acceptable.

Is that fair to say?

A Well, not necessarily they're identical situations. So, for example, a land area that will never have residential use, in other words, it's fenced off, will always be fenced off or will be industrial, will be -- will have a different set of criteria for their evaluation than an area that is residential.

Q I'm talking about residential areas.

Are you aware of any residential areas where EPA has approved an excess cancer risk of greater than 1 times 10 to the minus 4?

A You know, I could envision that there might

be, but I'm not aware of one at the moment.

Q And but that --

A It's rare.

Q -- wouldn't be outside of their guidelines to do so?

A It would be rare. And it would be, I would think, fairly extraordinary circumstances given the guidelines as they are written.

Q And you selected 1 times 10 to the minus 5 for your target risk level because it was between 1 times 10 to the minus 4 and 1 times 10 to the minus 6?

MR. STALPES: Objection; asked and answered.

THE WITNESS: Well, we could be -- I could have gotten the most conservative and used 1 times 10 to the minus 6, which is often what EPA uses. But I think my experience with states and again, Montana has its recommended cancer risk level at 1 times 10 to the minus 5th, that seemed to be appropriate, given the document that I reviewed on that.

BY MS. STEVENSON:

Q You would agree with me that the State of Montana approved the remedy that's in place for the Anaconda Superfund site?

A I assume so. I don't know that for a fact,

but I assume so.

Q Do you think it's appropriate that clean-up action levels vary at different Superfund sites?

A They -- I think what you are getting to is more of a risk management decision, which is more of an agency-type decision. And there's more than just the risk assessment that goes into that.

Q So is that a yes?

A I don't --

Q Is it appropriate for clean-up action levels to vary among Superfund sites?

A Is it appropriate?

Q Yes.

A I don't know if it's appropriate. It happens.

Q Do you think that it's inappropriate that that happens?

A I don't know how to put my arms around all of the possibilities that that question entails.

Q Do you agree that EPA has a preference to use site specific data when it's available?

A Yes. EPA likes to use site specific data, if it's possible.

Q And site specific data could cause an action level to vary from one site to another depending on

the availability of that data?

A The site specific information, if accessible, reliable, fills important data gaps, of course it could potentially use that. But if it misses that information, then I don't understand how that could be used appropriately.

Q But the availability of that data could cause action levels to be different at different Superfund sites?

A That would be one rationale that would make sense to me is that the quality and the availability of pertinent data that's site specific can be useful, yes.

Q Are you giving any opinion in this case that exposure to residential soil at 250 parts per million arsenic is injurious to health?

A I'm saying that at 250 parts per million, it is an unacceptable cancer risk to those individuals based on the process that I followed.

Q Okay. So you are giving an opinion that there is an unacceptable cancer risk at 250 parts per million in the Opportunity community?

A I'm saying that the way that I calculated the HHRA, that the levels that result, 250 is not substantiated. The values that even the report has

at cancer risks at 1 times 10 to the minus 5 and 1 times 10 to the minus 2 are much smaller; therefore, the 250 does present an unacceptable cancer risk that is unexplained.

03:16 Q And that's a risk that you calculate to be I think 3.6 times 10 to the minus 4; is that right?

A That sounds -- if it's not exact, it's close.

Q And in your opinion, that is an unacceptable 03:16 cancer risk?

A In what data that were used in the HHRA, which I pretty much followed, I didn't really use much different data than the HHRA did, other than I included pathways, all pathways, and I found that the 03:17 cancer risk was over 1 times 10 to the minus 4. And that is a concern.

Q It's a concern?

A Of an increased cancer risk, that those individuals living under that situation would have 03:17 an unacceptable cancer risk.

Q Does it present any concern of an actual health risk to any of the plaintiffs?

MR. STALPES: Objection; asked and answered.

MS. STEVENSON: Fair enough.

03:17 MR. STALPES: You can go ahead and answer it.

The question's still pending, go ahead.

MS. STEVENSON: It's okay.

THE WITNESS: Do you want to repeat that, please?

03:17 MS. STEVENSON: It's okay.

Q Do you -- and I'm sorry.

A Do you want to repeat?

Q I think you are not giving an opinion about what soil action level would be required to remove 03:18 that risk.

Is that fair to say?

Is there a soil action level that you would say there is no unacceptable risk?

A Well, I think there's infinite numbers of 03:18 levels below the 250. For example, doesn't the -- the CDM, the HHRA actually has 1 times 10 to the minus 5th cancer risk, which is below 1 times 10 to the minus 4. Isn't it in the 20 parts per million, like 20 to 30 parts per million? Isn't that in the 03:18 document?

Q I'm just asking are you giving an opinion. I haven't seen it in your report as to what that level should be.

A No. There are other documents that provide 03:18 support for the work that I've done.

Q Have you told any plaintiff in this case to do anything to reduce their risk of exposure to arsenic in their soil?
A No.
03:19 Q Have you told them to stop eating vegetables from their gardens?
A No.
Q Have you told them not to use their yards?
A No.
03:19 Q Have you told them to take any special precautions to not ingest soil or dust?
A No.
Q Have you told them not to let children play in their yards?
03:19 A No.
Q Have you told them not to let the pets use their yards?
A No.
Q Do you think you should do that to reduce
03:19 their risk?
A I think what should be done is the HHRA should be done according to the gold standard guidelines.
Q And that's something that would happen
03:20 through the EPA?

A I guess many organizations could do that. Right now, as it's calculated, using standard best science, pretty much the same data that they use, it comes up with values that are at or greater than 1 times 10 to the minus 4, which is outside EPA's guidance.

Q Would you agree with me that many people in the northwestern part of the United States live at properties with soil that has more than 8 parts per million arsenic on it?

A Did you say in the Pacific Northwest?

Q Yes.

A I'm sure there's locations, as I mentioned, Montana did a survey and came up with 40 for their 90 percent or 95th percentile soil background level.

Q Do those people have any unacceptable cancer risk associated with that?

A Well, I didn't ask to look at it. I'm just telling you background levels.

Q You don't know?

A Depends on the exposure pathways and the risk assessment process. That would determine that for a particular location.

Q And I take it in your critique of the HHRA and your subsequent analysis that you are trying to

improve on the HHRA that was done by CDM for the EPA back in 1996?

A Improve upon it?

Q Yes.

03:22 A I don't know what you mean by "improve."

Q I think you pointed out that it has errors that you think you have corrected.

Is that fair to say?

A I believe that it did not follow the process

03:22 as I followed it, yes.

Q And that would be an improvement, correct?

A I'm just saying whether it's done well according to guidelines or not.

Q And you think the way you suggested it be

03:22 done would be done well and according to guidelines; is that correct?

A I think it should be done according to guidelines and that for those issues that there should be a transparent process of why there was a

03:22 determination to do one thing or another so that people when they read it can follow it.

Q And that's what you have done in your risk assessment?

A Yes, I believe I've been pretty specific and

03:22 transparent.

Q And that would be better than what you think EPA did in their assessment?

MR. STALPES: Object to the form.

THE WITNESS: Well, I don't know about EPA in general, but I would say that the CDM risk assessment for which we are talking about could be greatly improved. It's -- it's underestimating the cancer risk based on its own guidelines, so I can't explain why it deviated that way.

BY MS. STEVENSON:

Q Do you have any evidence that you are relying on in this case that any plaintiff in this case has suffered any actual health effect from exposure to arsenic in their residential soil?

MR. STALPES: Objection; asked and answered.

THE WITNESS: Well, to the degree that they have, the HHRA is expressing an unacceptable cancer risk as defined by EPA, the answer is yes, cancer.

BY MS. STEVENSON:

Q Okay. But that doesn't apply to any individual plaintiff in this case, does it?

A What do you mean by individual, like Mr. X and Ms. Y or something like that? Or are you referring to something else?

Q Sure.

The risk assessment, the HHRA risk assessment incorporates a bunch of hypothetical assumptions, correct?

A Well, they are based on pathways of exposures that exist. They are based on a reasonable -- reasonable maximum exposure that could occur. They are based on data regarding the amounts in the soil and other media as well.

So I think the answer is that they are raising the issue of cancer risk to a population that is either there or could be there in the future.

Q And my question was, do you have any data to show that any of the actual individual plaintiffs in this case have suffered any health effects from exposure to arsenic?

A I have not been asked to look at that.

Q Have you suggested to any plaintiff that they should have any medical testing done to find out if they have been exposed to arsenic?

A No.

Q Is there anything -- any reason why plaintiff couldn't go and get medical testing to find out if they had any actual arsenic exposure?

A Is there any -- I'm sorry, again?

Q Any reason why a plaintiff couldn't go and

have medical testing to find out if they have been exposed to any -- actually exposed to any arsenic?

MR. STALPES: Objection; foundation.

THE WITNESS: I think some of the studies already demonstrate that there's exposure at the site.

BY MS. STEVENSON:

Q In Opportunity?

A Well, in the Anaconda area.

Q Opportunity specifically?

A I would have to look at the individual studies, but the urine study that Dr. Tsuji is referring to presents evidence of exposure.

Q Okay. For people in Opportunity or elsewhere within the Anaconda smelter Superfund site?

A I would have to look more specifically at that.

Q Can you recall how the urine levels of the children studied in Opportunity compared to the children studied in the control area?

A My understanding was that they are, in general, elevated compared to others as well in the country and that there is some question about the methodology that was used as well to determine whether that can be accurately assessed.

Q You didn't review any medical records for any plaintiff in this case, did you?
A No.
Q And you didn't request to do any biomonitoring of any of the plaintiffs, correct?
A I did not.
Q Are there medical tests that can be done to find out whether a person's been exposed to arsenic?
A Yes.
Q What are those?
A Well, you could do it -- I think the question is how to do it and what does that -- what would that require. But there's anything from tissue samples of some sort, urine, which include urine or blood, hair, nails. But again, each one has strengths and limitations and then the frequency and kind of the protocol that would be necessary would need to be considered pretty carefully.
Q But if a person's been exposed to arsenic, you can detect that in their urine.
Is that fair to say?
A If you are just asking is there a method to detect arsenic in body tissues, the answer's yes. But interpreting exactly the -- what that means requires a careful assessment.

Q Are you aware of any evidence anywhere of any person in the Anaconda smelter Superfund site having an adverse health effect from exposure to arsenic in residential soil?

03:29 A I haven't looked at those data, so I don't know the answer to that.

Q Would you agree with me that the best evidence of human toxicity derives directly from observations of exposed humans?

03:29 A That the best --

Q Evidence of human toxicity derives directly from observations of exposed humans?

A I think it depends on what observations you are talking about.

03:30 Q Would that sentence be true for exposure to arsenic?

A Depending on what outcomes you are looking for.

Q Well, if you wanted to know if a person was

03:30 experiencing a toxic dose of arsenic, would it be best to observe the actual person?

A Are you saying like a clinician evaluating the person? Is that what you are asking?

Q Would the best data about whether or not

03:30 that person had been exposed be available by directly

observing that person versus their surrounding environment?

A Observing the person, like their behavior? I'm not quite sure I'm following your question.

03:30 Q No. Tissue samplings, all of the ways you might detect a person's exposure in health effects.

A Well, identifying -- doing a proper study and identifying those that have the potential for exposure would be key, no question. But it depends

03:31 on what the study design is, making sure that you are looking at end points that are relevant and conducted in a timely manner. Those are really -- those become critical points.

Q And you would agree that the University of

03:31 Cincinnati, the urine arsenic study that we have been talking about, did attempt to actually take observations of individuals who could be exposed to arsenic in the Anaconda smelter Superfund site.

Is that fair to say?

03:31 A Well, I think that the word -- it's a difficult study and a difficult one to do well, as well, just because of the urine volumes on a day-to-day base and the changes in urine, kind of the dilution of urine and things on that line.

03:31 So it's not a trivial exercise to do that

type of study well. Certainly the study they did, it is what it is, but there are opportunities for improvement on the study design.

Q Well, every study has limitations, doesn't it?

A Not quite. Some have bigger ones than others.

Q Okay. How many children were studied in the Anaconda smelter Superfund site area in that University of Cincinnati study?

MR. STALPES: Object to the form.

THE WITNESS: How many children? I think hundreds. I don't remember the exact number.

BY MS. STEVENSON:

Q More than 400; is that right?

A Sounds vaguely familiar.

Q And do you recall what level of participation the study had for families in the area?

A Not offhand, but I would -- I believe it was something around the at least 50 percentile.

Q 80-plus some, correct?

A I don't know.

MR. STALPES: Objection.

THE WITNESS: I said 50.

MR. STALPES: If you are going to quiz him on

numbers and the study -- you want to show him the study?

BY MS. STEVENSON:

Q Are you aware of any arsenic exposure biomonitoring study that is more thorough than the University of Cincinnati study?

A I don't know. I don't have an answer to that question.

Q You can't tell me about one sitting here today?

A No.

Q Would you agree with me that that study sampled soil, dust, water, all of those things in addition to biological samples?

A That's my recollection, yes.

Q Can you agree that the Anaconda smelter Superfund site is one of the most well-characterized Superfund sites in the country?

MR. STALPES: Object to the form.

THE WITNESS: I don't know the answer to the question. I certainly have read, you know, clips here and there, like at the introduction of papers or various documents and I think Dr. Tsuji says that as well. You know, it's true that it could be the most well-characterized and still be insufficient.

BY MS. STEVENSON:

Q Is there any site that you can think of that is better characterized?

A Not offhand.

(Deposition Exhibit 9 was marked for identification and is attached hereto.)

BY MS. STEVENSON:

Q Dr. Pleus, I'm handing you the Hwang study. And you would agree with me this is the published version of the University of Cincinnati urine arsenic study at the Anaconda smelter Superfund site?

A Yes.

Q Let me have you look at table 3.

A Table 3?

Q Yes. If you look at study area G, do you recall that to be Opportunity?

A That's my recollection.

Q And this has two charts, one for total arsenic and one for speciated arsenic.

Do you see that?

A I do.

Q And speciated arsenic is the category that you are interested in in terms of assessing human health.

Is that fair to say?

A Not necessarily. I think both are informative.

Q Total arsenic includes both inorganic and organic arsenic.

Is that fair to say?

A Yes.

Q And speciated arsenic is inorganic arsenic?

A I believe that's what -- I believe that's what they were referring to here.

Q This chart reports that the speciated arsenic concentration, average concentration for Opportunity was 6.9.

Do you see that?

A Yes.

Q And then if you look a little bit down further, it has the numbers for the remote areas.

Do you see that?

A Hold on. Yes.

Q And the average for the remote areas was 7.1.

Do you see that?

A I do.

Q So would you agree that this study concluded that the speciated arsenic levels of children in

Opportunity was less than the speciated arsenic levels of children in remote areas that were not impacted by the smelter?

A Based on just looking at those numbers without anything else, that certainly would be one possible conclusion, but I don't think it's the only conclusion.

Q But what would be another conclusion you could draw from those numbers?

A Well, I think one concern is the number -- the N, if you will, the sample size, and it's relatively small, given that location.

Q I'm sorry. What number? Oh, the number N?

A It's number N.

Q I see.

A Which is 22 for total and 20 for speciated.

And so the question becomes one of, okay, so then where were the kids, where were the locations, what -- what can we learn more about that particular subpopulation of this whole group. And I think that raises an important question about the results.

Q I'm sorry. The sample size raises an important question about the results?

A The sample size can influence greatly. It leads to questions such as, A, was the population

sufficient for the sampling to be done; B, does it -- where were those individuals, how were they identified? Was there anything in particular about those small groups, were they representative, things along those lines.

03:38

Q Do you know what the level of participation was for children in Opportunity for this study?

A I don't recall offhand.

Q Okay.

03:38

A Still a small population.

Q Is a high participation rate better than a low participation rate?

A It's hard to say. It could be, it could not be. The question is more the representative sample, is it a sufficient population that represents that group of kids in that area.

03:39

Q So if it were all of the kids, that would have to represent the kids in the area, wouldn't it?

A Yeah, that would.

03:39

Q Were you aware of any significant discrepancies among the sampling results for the children of Opportunity?

Can you remember in reviewing this study whether there were any significant discrepancies among the children of Opportunity?

03:43

A I don't recall anything in this particular document, but I'm kind of double-checking a couple of the data tables.

Okay. I think I'm ready to answer your question.

Q Is there anything that suggested that the children in Opportunity had discrepancies, significant discrepancies, among their sampling results?

A There's nothing that I can recall. More of the questions are related to the experimental protocol.

Q Okay. Understanding that you have some issues with the protocol, is there anything in the overall results of the study that points in the direction of there being health concerns for people in Opportunity with respect to exposure to arsenic in the residential soil?

A Well, I think it demonstrates that they are exposed.

Q At any soil concentration?

A No. At the soil concentrations that were taken during the study.

Q And was there a correlation between exposure and soil concentration at all levels of arsenic

concentration in the soil?

A No. I would think that there are some very, you know, low levels that would not necessarily be detected but some at higher levels that would be.

03:46 Q Is it true that there wasn't any correlation between arsenic exposure and arsenic soil concentration until you exceeded 300 parts per million in soil?

A Can you point specifically where you are referring to?

Q Well, I'm looking at the figure 3 would be one basis for that.

A I'm sorry. What was your question now that I have figure 3 in front of me?

03:47 Q One second. Is it accurate to say that there's no correlation between exposure to arsenic and arsenic concentration in soil until you exceed 300 parts per million?

A I don't see how you are coming up with that, given this data.

Q Are you aware that that was a conclusion of the study?

A Again, is there something that you are pointing to?

03:47 Q No, I'm not pointing to anything. I'm just

asking for your memory.

A I don't recall.

Q Do you recall any of the findings from the study about whether or not there was a correlation between exposure to arsenic and arsenic concentration in soil?

MR. STALPES: I'm just going to object. This is just quizzing him on the recollection of this here.

MS. STEVENSON: It's a pretty important study, so we're going to quiz him.

THE WITNESS: You said two variables, it sounded like the same, so I'm not sure I understood you.

BY MS. STEVENSON:

Q Arsenic exposure as measured through urine and soil arsenic concentration. I'm just asking for your memory.

A Well, it's not an easy question to answer, because soil bioavailability could change from one location to another. Again, the study has -- if it has some issues with its protocol, then the data are less reliable or can't be relied upon for certain conclusions.

(Deposition Exhibits 10 and 11 were marked for identification and are attached hereto.)

BY MS. STEVENSON:

Q Dr. Pleus, Exhibit 11 is your rebuttal report, correct?

A Yes.

03:49 Q Looking at the bottom of page 10 of your rebuttal reports, you are talking about the Hwang University of Cincinnati study that we --

Oh, I don't have an extra copy. It's his rebuttal report.

03:49 We were talking about the University of Cincinnati study, the Hwang study, which you are discussing on page 10 of your rebuttal report.

Do you see that?

A I do.

03:50 Q And at the bottom you say, "The effect of soil arsenic on urinary levels is illustrated in figure 3" -- which we were just looking at, correct?

A Uh-huh.

Q -- "which shows a clear correlation between 03:50 concentrations in bare soil areas of yards with speciated urinary arsenic levels."

Do you see that?

A Yes.

Q So I assume you thought the protocols of the 03:50 study were good enough to support that conclusion; is

that right?

A Yes.

Q Okay.

A But I think you were asking a different question that I was attempting to answer.

Q Well, that was the question I was asking now.

You then say, "Thus this study demonstrates that soil can be a significant source of exposure to arsenic."

And my question is, what do you mean by a "significant source of exposure to arsenic"?

A What I'm referring to is in the risk assessment, it would be a pathway that you would include.

Q Okay. And it was included as a pathway, correct?

A In the original CDM, it was, yes.

Q By "significant," you don't necessarily mean it's a substantial exposure to arsenic in the sort of absolute sense.

Is that fair to say?

MR. STALPES: Objection; vague.

THE WITNESS: What I'm referring to is from the risk assessment perspective, that it should be

included in the risk assessment and then determined whether or not it is a significant pathway or not.

BY MS. STEVENSON:

Q Okay. And how did you determine that figure 3 showed a clear correlation between concentrations in bare soil areas of yards and speciated urinary arsenic levels?

A Well, it does -- figure 3 does provide a -- the algorithm for the best line through the data and it provides an R value and it is not zero from what the P value is saying.

Q And is the R value the correlation coefficient?

A I would have to look back at the statistics, but I don't know if it's exactly the correlation. It depends on what they did, but it's -- it can be used to derive it.

Q Do you know whether the study found any correlation between urinary arsenic and arsenic in soils, other than with respect to this bare soil areas in the yards?

MR. STALPES: I'm sorry. Could you repeat the question? I wasn't listening there.

(The record was read as follows:

"QUESTION: Do you know whether

the study found any correlation between urinary arsenic and arsenic in soils, other than with respect to this bare soil areas in the yards?")

03:53 MR. STALPES: I'll object to the form. This is just asking him for citations from the study. The study says what it finds.

THE WITNESS: Again, I think the issue with this particular study is that, as the authors point out, 03:53 that would rely -- that would heavily influence the outcome of the interpretation of the data is -- are issues of the protocol and the potential for changes in bioavailability, which would have a direct impact on any of these variables that were taken.

03:54 BY MS. STEVENSON:

Q Okay. How would bioavailability affect the urine arsenic sampling that was done?

A If the material doesn't release from soil, more or less it would influence the amount that would 03:54 come out of the urine potentially. It's one of the factors. If the arsenic was located into some other tissues for some other reason, that might influence it as well. Those are two examples.

Q Well, if the material's not bioavailable 03:54 unless -- people aren't being exposed to it; is that

right?

A I think those are several questions -- those are like several questions. The question is about the study's design and the results and whether these results are reliable for every indication that you are raising. And the answer is the study protocol doesn't necessarily provide the level of competence that is being stated. So whatever the variables, whatever the parameters are for, you know, individual variables, they do impact the results of the study.

Q Have you look at Dr. Tsuji's rebuttal report. Let's look at page 26. Dr. Tsuji says that "Evidence from newer studies indicates that urinary arsenic is considered the best biomarker of arsenic exposure and is reflective of the daily dose, particularly under steady state conditions."

Do you see that sentence?

A I'm sharing it at the moment. Can you point --

Q It's right under section 3.4.1?

A Okay. Okay. I see the sentence.

Q Do you agree with that?

A I think it can be, if the study protocols are done well, yes.

Q And would you agree that the University of

Cincinnati study was done under steady state conditions?

A No.

Q Why not?

03:57 A Well, they took two consecutive days of sampling.

Q And why is that not steady state?

A For a host of different reasons, but one of them could be seasonal effects. In other words, an

03:57 example would be taking samples at different times of the year for the same child, that would I think provide a better example of steady state.

Q Would you agree with me that children were studied in the University of Cincinnati study?

03:58 A Would I agree with that?

Q Yes.

A It's what it appears to be, yes.

Q And would you agree that children are the most exposed to arsenic in soil?

03:58 A They certainly can be.

Q And would you agree with me that arsenic exposure from soil would be highest during the summer in Montana?

A Maybe.

03:58 Q You don't know one way or the other?

A I don't necessarily agree that it would be.
Q When do you think it would be the highest?
A I actually don't know enough to say whether the springtime, the fall or the summer would be. There are possibilities of winter with lack of snow, that would be another arena as well.
Q Did you review any studies that -- actually, let me have you look at page 28.
In the middle paragraph, about the second half, Dr. Tsuji says "Dr. Pleus refers to seasonal variation, implying that this produced uncertainty in the results."
Is that what you were just describing to me, the seasonal variation?
A That would be an example, yes.
Q She says, "The urinary arsenic data used to represent exposure at the site were those measured in summer when arsenic soil and dust exposure would be highest."
Do you disagree with that?
A I think I'm disagreeing with that from what I just answered to you.
Q And do you think that arsenic soil and dust exposure would be higher at another time or you just don't know if it's highest in the summer?

A I don't have any evidence that it's higher in the summer versus spring versus fall versus winter, and I've not seen any data that provides a valuation of that.

04:00 Q The next sentence says, "The childhood arsenic study reported a strong seasonal rhythm in urinary arsenic level, its highest levels in July and August and the lowest in January."

Do you see that?

04:00 A Uh-huh.

Q Do you disagree with that?

A Well, those are two time points.

Q Do you know how often the children were sampled throughout that year?

04:00 A I don't recall. Let me look.

What was the question?

MR. STALPES: What was the question again?

(The record was read as follows:

"QUESTION: Do you know how often

04:02 the children were sampled throughout

that year?")

MR. STALPES: Which year? Sorry. Objection.

MS. STEVENSON: The year that the University of Cincinnati study took place.

04:02 THE WITNESS: It doesn't specifically state that

a child was studied throughout the year.

BY MS. STEVENSON:

Q You are just looking at the Hwang study?

A I am looking at the Hwang study.

04:02 MR. STALPES: Is that not what you wanted him to look at? Because I assumed you were quizzing him on an aspect of the Hwang study.

MS. STEVENSON: There are multiple University of Cincinnati studies that ended up published as the 04:02 Hwang study. I don't know if he's looked at them all or not.

Q Have you looked at all of the University of Cincinnati studies related to this project or just the Hwang study?

04:03 MR. STALPES: If you are going to quiz him on particular aspects --

MS. STEVENSON: I'm not quizzing him. I'm asking him -- I'm trying to understand his opinion as to whether he has data. He said this was only two 04:03 samples. I'm asking him if there were other samples. If he doesn't know, he doesn't know. That's okay.

Q Do you know if there were other samples taken during the University of Cincinnati study?

A I can't recall specifically what you are 04:03 asking, so I'm not really sure.

Q You just made the point that these were only two samples levels in July and August and lowest in January. And I'm asking whether you know whether there were samples taken throughout the year?

04:03 MR. STALPES: I feel like you are quoting from Tsuji's report and saying you opined this.

MS. STEVENSON: No. He just gave me -- I'm quoting back to him what he just said.

MR. STALPES: Are you not reading from page 28 of Joyce Tsuji's report?

MS. STEVENSON: I did, and I asked him if he agreed.

MR. STALPES: That's that what it says.

MS. STEVENSON: No, I asked him if he agreed with that statement.

MR. STALPES: I'm lost here. I'm sorry. I don't understand what's being asked or what's going on.

THE WITNESS: Do you have a copy of the study that is --

BY MS. STEVENSON:

Q Not that I want you to read right now.

You don't know? Is that your answer?

MR. STALPES: It's Exhibit 9. She gave you the Hwang study. I'm so lost here.

BY MS. STEVENSON:

Q If you know whether or not the children in the Bornschein study were sampled at two points during the year or throughout the year.

Do you know or do you not know?

A What I can tell you is that I don't see it stated in the Hwang study, so I don't know specifically if this is one in the same or something different.

Q Now, let's look at page 27 of Dr. Tsuji's rebuttal report. Look at 3.4.2. Dr. Tsuji says that you imply that the childhood biomonitoring study is unreliable for accessing exposure because of methodological issues; is that true? Do you agree with her summary of your criticism?

A It depends on exactly what she is referring to. Sometimes Dr. Tsuji is not particularly clear.

Q I think you raised earlier in this deposition that you didn't think that the two consecutive morning urinary void samples provided reasonably accurate arsenic exposure levels; is that true?

A What I'm saying is that if two consecutive samples are taken on a, you know, day one and day two, that that's not sufficient, given studies where

I've been involved in detecting urinary metabolites to get an accurate picture of what is going on. Two consecutive days of spot urines or first void urines is not sufficient.

04:06 Q Is there a difference between first void urines and spot urines taken later in the day in terms of their reliability?

A There can be, but again that's really based on, you know, an individual pattern. You know, the 04:06 best of all is to collect a 24-hour urine, for example.

Q And there were study subjects in the University of Cincinnati study for whom that was done; Isn't that right?

04:06 A There may have been. Not these data that are being relied upon.

Q Are you aware how many subjects were -- had 24-hour urine samples collected from them?

A I don't recall.

04:06 Q And do you recall whether that showed -- indicated that the first morning voids were inaccurate or accurate?

A I don't recall those data at the moment.

Q At the bottom of that paragraph, she says, 04:07 that "Hwang also reported that the two first-morning

void samples were highly correlated for individuals."

Do you see that?

A Yes.

Q Okay. Do you agree that that's true?

04:07 MR. STALPES: Objection; vague. Correlated to what?

MS. STEVENSON: To each other.

THE WITNESS: Do you have a copy of that study?

BY MS. STEVENSON:

04:07 Q I already gave it to you.

A I don't think so.

Q Hwang. Oh, 1997 B.

A It's B.

Q Yeah, I don't want you to read that right

04:08 now.

You don't know off the top of your head?

A I'm not familiar with that study to make a recollection as I sit here at the moment.

Q Okay.

04:08 A But I would like to see it.

Q I'll give it to you when we leave today.

A No, to answer your question.

Q I think the answer is you don't know right now, which is a fine answer.

04:08 A Okay.

Q Have you look at the bottom of page 28. The last paragraph there, Dr. Tsuji says that, according to you, "Another source of uncertainty that limits EPA's comparison of its risk assessment with the biomonitoring data is the lack of full speciation of arsenic in water, soil and dust."

Do you see that?

A Uh-huh.

Q And is that a criticism you made in your opening report?

A Uh-huh, yes.

Q On the next page, Dr. Tsuji responds to that and says that in the -- I'm looking in the middle of the second paragraph, "Unlike for urine, these arsenic forms and other organic forms are not speciated in soil, dust and water because arsenic forms in these media, soil, dust and water, are known to be largely inorganic."

Do you see that?

A I see where you are reading, yes.

Q Do you agree with her statement that arsenic forms in soil, dust and water are known to be largely inorganic?

A I'm reading the sentence and I'm trying to listen to your question and I'm not sure I followed

either one yet.

Q Do you agree with Dr. Tsuji that arsenic forms in soil, dust and water are known to be largely inorganic?

04:10 A They can be, yes.

Q And so does that alleviate your concern that you raised about the fact that there wasn't speciation of the arsenic in soil, dust and water?

A No.

04:10 Q Why not?

A Because I think these are questions that go to the heart of the calculations and the assessment of potential exposure. And the information on the analysis, at least as I read it, had certain

04:10 questions that were -- remained unanswered as to the quality and the ability of those analytes to conduct such a study, other than just making an assumption based on the literature.

Q Have you look down at the last paragraph on

04:10 that page, the first sentence, Dr. Tsuji notes that "The standard practice for environmental sampling of arsenic in soil, dust and water is to measure the total arsenic concentration rather than to speciate the samples for various organic arsenic forms because

04:11 the forms of arsenic present in these media are

overwhelmingly inorganic," and she then cites ATSDR.

A Uh-huh.

Q Do you see that?

A Uh-huh.

04:11 Q Do you agree with that or disagree?

A It certainly can be that the standard practice is measuring total arsenic. I mean, I think that's a pretty straightforward point. However, that doesn't necessarily mean that that is the best 04:11 approach to conducting a study. Just because it's done that way doesn't mean that there isn't a better way to make that determination.

Q Okay. Would you agree that assuming that all of the arsenic was inorganic rather than 04:12 speciating it, if anything would result in an overestimate of the arsenic exposure in this study?

A It's a good question. It's possible. The somewhat difficulty is that inorganic arsenic then gets metabolized to organic arsenic in the body and 04:12 so kind of the separation of bodily burden versus source could contribute to that.

Q You are saying that inorganic arsenic turns into organic arsenic in the body?

A It can.

04:12 Q Under what circumstances?

A DMA, dimethylarsenic.
Q And that DMA is measured in urinary arsenic?
A Yes.
Q So that could be accounted for, correct?
04:13 A Yes. Potentially. But I think the heart of the question is going back towards other sources of arsenic, not just inorganic.
Q Okay. Let's talk about that for a minute.
MR. STALPES: Do you mind if we take five here, 04:13 about an hour.
MS. STEVENSON: Where are we on tape?
THE VIDEOGRAPHER: We are about an hour and 18 minutes.
MS. STEVENSON: Okay. We can take a quick 04:13 break.
THE VIDEOGRAPHER: Going off the record. The time now is approximately 4:14 p.m.
(Off the record.)
THE VIDEOGRAPHER: Going back on the record. 04:25 The time now is approximately 4:26 p.m. This is the beginning of disk number 4 in the deposition of Richard Pleus.
BY MS. STEVENSON:
Q Dr. Pleus, do you know of any data that 04:26 contradicts the Hwang data with respect to exposure

to arsenic in soil in the Anaconda smelter Superfund area?

A Oh, in the Anaconda? Not that I recall.

Q Would you agree with me that all people are exposed to inorganic arsenic through their diet?

A Yes.

Q And would you agree that the level of inorganic arsenic that people are exposed to through their diet is substantially larger than people would be exposed to through soil at a smelter site?

MR. STALPES: Objection; speculation and vague.

THE WITNESS: No, I don't agree with that.

BY MS. STEVENSON:

Q Are you aware of smelter sites where people have been shown to have had more exposure from soil than through their diet?

A I think the Hwang study is a study that moves towards that.

Q The Hwang study doesn't consider inorganic arsenic from the diet at all, does it?

A Not specifically, but it addresses the question of other levels of urinary arsenic from other locations, that I recall.

Q Okay. But it assumes that all inorganic arsenic in the urine is from exposure to soil and

dust, not from diet.

Is that fair to say?

A In this particular study, the Hwang is what you are saying?

04:28 Q Yes.

A I think they mention that they understand that, but they did not, to my recollection, address that specifically.

Q And would you agree with me that at least 04:28 some of the speciated arsenic that was reflected in the urine of the subjects of the Hwang study came from their diet?

A I certainly suspect that some of it, but it's hard to say how much.

04:28 Q Talk to you about the pathways that you include in your risk assessment, so if you can get your report. Looking at page 41 --

A Got it.

Q -- these are all of the different pathways 04:29 that you include in your risk assessment here at table 8; is that correct?

A Yes.

Q Now, some of these are not soil related. Is that fair to say? Like ingestion of surface or 04:29 groundwater?

A I'm sorry. Repeat your question. They are not soil related, is what you are saying?

Q Right.

A And you said as an example, ingestion of surface or groundwater?

Q Yes.

A That, I don't know.

Q I mean, if you were ingested --

For example, if you cleaned up soil on your property, would that reduce your exposure to arsenic through ingestion of surface water?

A It could. Doesn't have to, but it could, yes. Depends on the source, the size. Is it a pond, is it a river, things along that line.

Q When you were looking at this pathway, were you looking specifically at ingestion of surface or groundwater on plaintiffs' properties?

A On the plaintiffs' properties, I think it was data that was found in the studies. Hold on. I think on page 37 I describe the source of information.

Q Going back to page 41, do you agree with me that you have three pathways here that make up 88 percent of the total risk, and that would be ingestion of soil, ingestion of dust and ingestion of

produce?

A Those are definitely the three highest pathways, yes.

Q All right. And you attribute 38.4 percent of the total risk to ingestion of homegrown produce; is that right?

A Yes. Although I make -- I'm very clear about the amount and assumptions and things like that.

Q Let's talk about some of those.

When you calculated your risk related to homegrown produce --

Did you do any surveys or anything to find out whether people in Opportunity grow vegetables in their yard?

A Did I do a survey?

Q Yes.

A Did Intertox or did we send out a questionnaire?

Q Yes.

A The answer's no.

Q Do you have any specific information on whether people in Opportunity actually grow vegetables on their properties?

A Yes.

Q What is that information?

A It's information provided by the attorneys in this case, and also the HHRA talks about it as well.

04:32 Q And to the extent people are growing produce, plaintiffs are growing produce on their properties, do you know whether they are growing it in soil that would have been impacted by the smelter or soil that they imported specifically for gardening

04:33 purposes?

A Again, the HHRA is to make an estimate of the reasonable maximal exposure of what the cancer risk could be assuming these pathways. And so based on that, that information, was there a pathway, the

04:33 answer is yes. Was there information that provided simply whether there are vegetables and produce that are grown, the answer is yes. And so that was the data that we used or I used.

Q And so did you assume, then, that produce

04:33 was being grown in soils that were impacted by smelter emissions or had elevated arsenic levels?

A Yes.

Q And I think your assumption is that 25 percent of a person's vegetable intake for the

04:34 year would be from homegrown vegetables; is that

correct?

A I believe that's correct.

Q And you would agree with me that even store-bought vegetables have inorganic arsenic in them.

Is that fair to say?

A I think it depends on what it is, but in general, they would. I would expect them to have some potentially.

Q And so when you looked at this 25 percent of homegrown vegetables, did you deduct the 25 percent of vegetables that that would replace -- of store-bought vegetables that that would replace or did you consider a person's full exposure to store-bought vegetables and then an additional 25 percent of homegrown vegetables?

A Just made the assumption of the 25 percent of this, of grown in the crops -- in the area.

Q But did you consider that that consumption would be on top of a person's regular store-bought vegetable exposure to inorganic arsenic?

A I would have to think about that. The HHRA doesn't necessarily account -- ask for an accounting of that difference and may already incorporate that assumption in it. I don't recall right now.

Q You would agree with me that if a person was eating 25 percent of their consumption of vegetables from their garden, they would be eating 25 percent less store-bought vegetables.

Is that a fair assumption?

A Possibly.

Q Are you aware of any other Superfund sites where ingestion of produce, homegrown produce, has been considered to be a significant pathway in a human health risk assessment?

A Nothing I can recall right now. But I think the approach that I took was one where, you know, 25 percent is really quite a minimal amount compared to other risk assessments that we have done, so we try to be fairly reasonable, given the climate and the location. And as I said before, the HHRA actually states that produce is grown by people that live in the area.

Q The CDM's HHRA?

A Yes.

Q Okay. But it concluded that there was actually very little homegrown produce grown in the area, correct?

A I don't recall that being said that way.

Q Okay.

A And frankly, they never explained why they could -- why they just basically ignored it.

Q Do you think that 25 percent of veg- -- homegrown vegetables is a reasonable estimate for people in Opportunity?

04:37

A Based on our experience, again, and the reasonably maximum individual, whether it's today, present day, current or future, I think that's part of the guidance that we're asked to look at. I think it's reasonable to consider that that would be the case.

04:37

Q Let me ask you, when you are talking about the future, you are saying that in the future people may want to grow vegetables on the property even if they don't now.

04:38

Is that your understanding?

A Yeah. I mean, whether it's new people or people that come in, that's a potential future use of the land.

Q And you talk about that in your report?

04:38

A Are you looking for something that says about future use?

Q Yes.

A Actually, in your soil screening guidance, Exhibit 7, page 1.

04:39

Q I'm looking for something that you specifically said about future use. Just one second.

Let me have you look at the top of page 28.

A Of my report?

Q Yes. Says there that you note, "In the baseline HHRA, the pathway of ingestion of produce was not evaluated in part because Anaconda resident survey responses indicate consumption of locally grown fruits and vegetables is minimal."

Do you see that?

A Yes, I can read that as well.

Q And do you disagree with that?

MR. STALPES: I'm not sure. Does he disagree that it says that?

MS. STEVENSON: No. Does he disagree that Anaconda resident survey responses indicate consumption of locally grown fruits and vegetables.

MR. STALPES: The survey responses that they have?

Objection; vague. Go ahead.

THE WITNESS: Well, the sentence is what it is. But it provides no assessment of in defining what's minimal, what the survey results were, provides no information for which would be expected to cross that pathway off. And therefore I did it.

BY MS. STEVENSON:

Q You did what?

A I included that in the HHRA.

Q Okay. So you don't -- you just don't know whether that -- whether it's accurate or not that Anaconda residents have minimal consumption of locally grown fruits and vegetables?

A I think there's several components to that. Anaconda and Opportunity may be a difference, number 1. Number 2, at least the results that I had seen from the information provided by attorneys provided a pathway, just as that still provides a pathway of exposure. So those are -- the question is whether a pathway exists or not; and if it does, then it needs to be assessed.

(Deposition Exhibit 12 was marked for identification and is attached hereto.)

BY MS. STEVENSON:

Q Is this the information that you relied on in determining that there was a pathway with exposure through homegrown produce?

A Yes. This and the HHRA.

Q And this is all of the information that you had about that topic, this chart, Exhibit 12, and the

HHRA?

A It's really quite simple. Is there a pathway or not. And this provides evidence, as well as the HHRA provides evidence.

04:43 Q Of the 100 or so plaintiffs in this case, how many reported that they currently have a vegetable garden?

A I don't know. The question is they have them.

04:43 Q Is it -- is the impact or the exposure to arsenic through vegetables, does it vary from vegetable to vegetable?

A Yes, it can.

Q Did you consider that in your HHRA that you

04:43 conducted?

A I think it's pretty well spelled out how it was approached.

Do you want me to read it?

Q No. Let me have you look at page 30 and

04:43 page 35.

A 30 or 35?

Q Let's look at both, if you would. It's a little bit tricky.

On page 30, it looks like you're reporting a

04:44 value for above-ground protected produce at .006.

Do you see that?

A Milligrams per kilogram dry weight.

Q Yes.

A I see that value.

04:44 Q And a value for below-ground produce at .0036.

Do you see that?

A Yes.

Q And then on page 35, it looks like you reversed those.

And I'm just asking if you know which one you used in your calculations?

A I would have to go back and double-check the data sheets to double-check on that.

04:45 Q Do you know which one of those is correct?

A Not at the moment. Whether -- you mean correct? What do you mean?

Q Which one was accurate? Which one were you intending to use?

04:45 A I'm not sure at this moment.

Q If you wanted to mitigate exposure through the homegrown produce pathway, could you import soil, unimpacted soil for your garden?

A Would that be a way to as opposed to growing it in ground that's contaminated?

Q Yes.

A That would be one potential way to reduce it. It doesn't decrease all components, but it does -- it could decrease the amount taken up by roots, for example.

Q Okay. Why would it not decrease all -- what do you mean by "all components"?

A Well, there could be some surface dust that lands on the plant that comes from other sources as well.

Q Okay. But it would eliminate arsenic that was being taken up into the plant via its roots which were in the ground?

A It would have an effect on that, that's correct. How much, I'm not quite sure, but it would have -- depends on what soil, you know, levels, depth, what are the soils surrounding the plot, things like that that would also need to be considered.

Q Would you agree with me that as soil arsenic concentration increases, the level of increase in arsenic that's taken up by plants is relatively much smaller?

A What do you mean by "relatively much smaller"?

Q Sure.

If you doubled your soil arsenic concentration, is it fair to say that the amount of arsenic taken up by a vegetable in that soil would not double?

A I think it depends on the crop but there are cases where that's true.

Q What case is that true?

A I can't think of it, but it sounds -- it sounds that that is the case.

Q For the most part, would you agree that the uptake would be -- would increase at a much lower rate than the increase in soil arsenic concentration?

A I'm not sure I understand your question.

Q Sure.

Would you agree with me that for most vegetables and most typical circumstances, the rate of increase in arsenic being taken up by the plant would be much lower than the rate of increase in arsenic in soil concentration?

A I think it depends on the range of arsenic in soil concentration. I don't think it's -- I think there are different ranges that -- where that would be true and different ranges that wouldn't be true.

Q What studies are there that show that

uptake of arsenic in vegetables is significant?

A I think, again, I have provided pretty detailed analysis of that on page 35, page 34, page 33.

04:49 Q And the studies that I have seen that you cite there are the Ramirez-Andreotta study; is that right?

A Those are some of them.

Q Was the Ramirez-Andreotta study, what kind 04:49 of soil were those plants grown in?

A Can you point to where you're speaking?

Q I'm looking at page 34.

A 34. So can you repeat your question, please?

04:50 Q Sure.

What type of soils were the vegetables being grown in in that study?

A I'm not quite sure I recall exactly if that can be determined from that sentence. Maybe I can.

04:51 Q Let me ask you this. Have you cited all of the studies that you know of that relate to uptake of arsenic and vegetables in your report here at pages 33 to 35?

A So back to your former question, it says 04:51 vegetables grown in mining-affected soils. I don't

know if I have -- if I included all of the literature. I included what I considered was the best science for the circumstances of this HHRA.

Q And are you aware of any --

Are you aware of any data to suggest that people in Opportunity eat meat that has been raised on their own properties?

A Am I aware of any data?

Q Yes.

A I think again I would point to both the information that's provided in Exhibit 12 as well as the HHRA.

Q Are you aware of anything else?

A I think that's sufficient.

Q Have you ever personally done a study of uptake of arsenic in vegetables?

A I have not.

Q Let me have you look at page 42 of your report. That's not correct. Page 45, I'm sorry. This is a chart that you provide reflecting arsenic action levels at various different sites.

Is that fair to say?

A Yes.

Q Do you know at which of these sites arsenic was the driver of the clean-up level?

A I can't recall specifically which one was, quote, the driver, but certainly a number of them. Arsenic was a significant contributor.

Q Would that be an important fact to consider in assessing the relevance of the arsenic action level that was selected?

A Not necessarily.

Q Why not?

A Let me make sure I understand your question. Are you saying that would these other assessments -- knowing that it was a driver in these other assessments, would that affect my interpretation of the 250 parts per million in this particular case?

Is that what you are asking?

Q No. I'm just saying if you are comparing different sites, wouldn't it make the most sense to compare sites where arsenic was actually the driver of the cleanup if you are comparing action levels among sites?

A Possibly. It's not a yes or no, depends on the site.

Q Sites where arsenic is the driver of the cleanup, it would typically be based on more site specific or data specific to arsenic?

MR. STALPES: Objection; speculation,

foundation.

THE WITNESS: I'm sorry, I don't understand.

BY MS. STEVENSON:

Q At sites where arsenic is the driver of the cleanup, is it more likely that site specific data has been acquired about arsenic?

MR. STALPES: Same objections.

THE WITNESS: I don't know.

BY MS. STEVENSON:

Q Are you giving any opinions about exposure to -- plaintiffs' exposure to arsenic in drinking water in this case?

A To the degree that I've included it in the HHRA, like surface water, that's what I've included, that's where I'm basing my assessment.

Q Are you giving any opinion that plaintiffs are subject to any health risk from their drinking water?

A I think -- let's see if it's -- I have ingestion at surface or groundwater as a line item, and it's based on that I have it at very low percent of total risk. It's less than 1 percent. So I did make an assessment, but it's a pathway that has a very low percentage.

Q Are you aware that --

What is ATSDR?

A It is a part of the federal agencies of the Centers for Disease Control. It is an organization that will conduct -- it will do a number of things. It produces toxicological profiles. And if there is a request for a health survey, it will consider that, things like on that line.

Q What is its mission overall, if you know?

A I don't know -- I can't -- I'm trying to imagine the website and I don't remember what it says as its mission.

Q Is it a public health agency?

A Yes.

Q And are you aware that ATSDR reviewed the remedy in place, the residential soils remedy in place for the Anaconda smelter Superfund site in 2007?

A I recall a reference to that, yes.

Q Did you review that, their report?

A It's been a while. I don't remember the specifics of it, but I do recall that I read it.

Q Did you note that ATSDR raised or addressed many of the criticisms that you have raised regarding the Baseline Human Health Risk Assessment?

MR. STALPES: Objection; broad.

THE WITNESS: Well, it's not their function to do an HHRA. That's not what they do and they didn't in this case. The question is on EPA's perspective, was this risk assessment done according to guidelines and, as a result of that, was there an excess cancer risk or an unacceptable cancer risk to those individuals based on the analysis.

BY MS. STEVENSON:

Q Okay.

A So it's almost an apples and oranges comparison.

Q Well, ATSDR would be interested and concerned if there were any excess cancer risk to people at the Anaconda smelter Superfund site, would it not?

MR. STALPES: Objection; foundation, speculation, argumentative and asked and answered.

THE WITNESS: I don't know. I'm assuming they would be interested, but I know they have plenty of other things that they are looking at as well.

BY MS. STEVENSON:

Q But they are motivated to protect the public health, correct?

MR. STALPES: Objection; foundation, argumentative.

THE WITNESS: I think to the degree that they understand what the situation is and the issues at hand, I would assume that they are, but I don't know. It's not clear to me that the risk assessment that's -- I know it's not clear that the risk assessment that was conducted, the HHRA, was done in a manner consistent with health effects with EPA.

MS. STEVENSON: I'm sorry, can you read me that answer?

(The record was read as follows:

"THE WITNESS: I think to the degree that they understand what the situation is and the issues at hand, I would assume that they are, but I don't know. It's not clear to me that the risk assessment that's -- I know it's not clear that the risk assessment that was conducted, the HHRA, was done in a manner consistent with health effects with EPA.")

THE WITNESS: The word "health effects" was an inadvertent addition. I meant the guidance of EPA.

BY MS. STEVENSON:

Q Besides you, do you know of any state or federal or local agency that has concluded that the

250 part per million action level is inconsistent with EPA guidelines?

A I don't know who's been asked that question.

Q Is there anybody that you are aware of who's come to that conclusion?

A I think there's some memos that raise those questions, but I don't know for a fact. But I don't know if anybody's ever asked that question.

(Deposition Exhibit 13 was marked for identification and is attached hereto.)

BY MS. STEVENSON:

Q Dr. Pleus, Exhibit 13 is a separate opinion that you've given in this matter regarding historical industry and Anaconda smelter operators' knowledge of adverse human health and environmental effects of arsenic and lead.

Do you see that?

A I do.

Q How did you prepare this report?

A Can you be more specific?

Q Sure.

What did you do to get the information to prepare this report?

A Conducted a literature search.

Q And so you reviewed articles?
A Yes. They are referenced in the document.
Q And I think that you said you at least reviewed Quivik's report, did I hear you say?
A Yes. And I make reference to it here.
Q Do you have any qualifications as a historian?
A As a historian?
Q Yes.
A Can you be more specific?
Q Yes.
Have you ever had any education or training to do the work of a historian?
A And what do you define as the work of a historian?
Q A person who studies history and writes about it.
A Yes.
Q What?
A I would say the -- all of the work that I've done in my Master's, my PhD, my post doc, my -- the work that I have done as a professional, all including this report, all includes understanding historical situations, what happened at what time, what did we know at one time and reporting that.

I've done that hundreds of times.

Q Is there any specific class you can tell me that you took in your -- after your undergraduate work related to historical analysis?

05:04 A Historical analysis? As it relates to toxicology, I just mentioned that, all of those.

Q Every class you took related to the study of history?

MR. STALPES: Objection; argumentative.

05:04 THE WITNESS: I'm not quite sure I understand your question.

BY MS. STEVENSON:

Q Is there any specific class you can tell me that you took in your PhD training that related to

05:05 historical analysis?

A I cannot think of a course that I took in my PhD that was specifically historical that was -- that had the word "history" in it in some way.

That, though, is not the way that PhDs and

05:05 grad students are trained. They use history on a daily basis in terms of understanding the outcomes.

Q How did you determine what --

You said you did a literature search; is that right?

05:05 A Correct.

Q And that had -- were those published articles that you were searching for?

A Well, they -- I think for the most part, they are all published of some sort, whether they be articles that are in a legal record or in some administrative hearing or they may have been peer reviewed or published in some other way, those are types of studies that were a part of what I looked at here.

05:06 Q Did you review any primary source documents?

A Meaning?

Q Documents of the Anaconda Company? Documents from the Bliss lawsuit?

A I believe so.

05:06 Q Which documents did you review?

A Well, again, I think I referenced them in my report. Is there something that I'm --

Is there a specific question that you have?

Q How did you obtain those documents?

05:07 A How did I obtain these documents?

Q The primary source documents that you said you reviewed.

A Well, I'm assuming that they basically are referenced on page 11, 12, 13 and 14, and those were

05:07 either obtained through libraries, possibly archived

at certain agencies, some of them may have been provided during my professional career. I can't recall all of the possible ways that I could have gotten these documents.

05:07 Q Did you yourself go to libraries and find these documents?

A I had my librarian do that.

Q And what did you tell her to look for?

A Documents that would provide an

05:08 understanding of what was known at what time relative to emissions from smelters at that point on both human health and ecological receptors.

Q And I think you give the opinion in your conclusions on page 10 that "The industry and

05:08 Anaconda smelter officials knew that mining and smelting facilities, including the Anaconda smelter, represented a source of arsenic and lead emissions."

Do you see that?

A I do.

05:08 Q Would it be fair to say that, for instance, federal government officials knew that, too?

A It's possible. You know, EPA at the time was never developed, so I can't really recall what type of agency would have known it at the same time.

05:09 Q Do you recall that the federal government

sued the Anaconda Company in the 19 teens over emission from -- emissions from the smelter?

A Yeah, I do recall that.

Q And they established a smoke commission to govern the operation of the smelter?

A Yeah, I recall that.

Q So would that suggest that they did have the same knowledge as Anaconda Company about the fact that the smelter was a source of arsenic and lead emissions?

MR. STALPES: Objection; speculation.

THE WITNESS: I don't know the answer to that question, who knew what at what time first.

BY MS. STEVENSON:

Q Okay.

(Deposition Exhibit 14 was marked for identification and is attached hereto.)

BY MS. STEVENSON:

Q This is the third amended complaint that's been filed in this case. Maybe look at paragraph 14. This paragraph says "Defendants intentionally, negatively, maliciously and/or with reckless disregard of plaintiffs' rights made affirmative representations and/or failed to disclose material

facts to plaintiffs and/or prior owners of plaintiffs' property. Defendants were aware of the toxicity and migration of said hazardous materials, knew the hazards associated with the migration of such toxic materials into the community and failed to warn plaintiffs or prior owners of plaintiffs' property that their health, welfare and property values had been jeopardized."

Do you have any facts that support those allegations in this complaint?

MR. STALPES: I'm going to object as broad.

Go ahead.

THE WITNESS: Well, I'm not an attorney, so I'm not familiar with writing these kinds of documents and I don't -- so I don't have an appreciation for style and understanding of what this is, nor do I have the insight of the author of this, what was intended at the -- by this particular statement. So there's a lot I don't know about what this represents.

Could you be a little more specific?

BY MS. STEVENSON:

Q Sure.

Are you going to get up at trial and testify about any misrepresentations that Anaconda or the

Atlantic Richfield Company made to any plaintiff or prior owner of plaintiffs' property in this case?

MR. STALPES: I'm just going to object. The report speaks for itself. All of the opinions are disclosed within the report. He's not the author of this document, as he mentioned, the complaint.

Go ahead.

THE WITNESS: I don't know how to answer the question based on how this is written. I don't know how to answer the question.

BY MS. STEVENSON:

Q I didn't see any allegations in your report about misrepresentations made by Atlantic Richfield or Anaconda, excuse me, to the community.

Do you intend to testify about any such misrepresentations?

A Can you define what you mean by "misrepresentations"?

Q A lie, something that's not true.

A I don't have enough of a grasp of this case to be able to answer that particular question. The word "misrepresentation," I'm glad you defined it for me. A lie would not have been my first understanding of that term. My understanding of a misrepresentation could be a lie, but it could also

be something that says here's what we knew or didn't know and we didn't present that information.

Q Okay. So do you intend to testify that there were times where Anaconda Company or Atlantic Richfield Company withheld information from the public that resulted in the public having a misunderstanding about something?

A Well, I think my -- if you go back to my report on this case --

I don't know how to answer your question.

Q You said that you've given a deposition, I think, 40 times approximately in your career?

A Yes.

Q And have you been retained as an expert -- I assume in all of those cases you were retained as an expert witness; is that accurate?

A Yes.

Q Are there times where you have been retained as an expert witness in cases in which you did not give a deposition?

A Yes.

Q How many in addition to the 40?

A No, that would -- I'm kind of thinking that that might include some of the 40 as well.

Q Have you ever been the subject --

Has your expert opinion ever been the subject of a motion to strike the opinion?

A Can you tell me how that might look, for example?

05:15 Q Sure.

Has anybody ever filed a motion in a case that said you should not be allowed to give part of your expert opinion?

A Yes, I believe so.

05:16 Q And in what cases has that happened?

A Seems to be occurring more frequently as a common procedure. I can't recall exactly what it is, but in every case it's not been successful.

Q Okay. So you have never been excluded by a 05:16 court as an expert?

A No.

MS. STEVENSON: One second.

(Deposition Exhibit 15 was marked for identification and is 05:17 attached hereto.)

BY MS. STEVENSON:

Q Handing you what's been marked Exhibit 15.

Did you assist in the preparation of that document?

05:17 A Assist in the preparation of this document?

Q Yes.
A No.
Q Have you seen it before?
A The numbers are familiar, but the actual page is not to me.
Q Do those numbers --
Do you just recognize them as a summary of some of the Kane sampling data?
A That's what I would have said, yes. I'm not positive that's the case, but that's --
Q Have you ever given any expert testimony in a case about arsenic?
A I believe, yes.
Q What case?
A I would have to go back, but we talked about the cases in --
So let me make sure I understand. Testimony on arsenic, meaning that it was part of an evaluation in a case or a risk assessment or something like that?
Q In a litigation.
A In litigation?
Q Yes.
A Yes, although I don't recall exactly what, but I believe the Omaha case that we talked about

earlier. Clearly the Everett case, arsenic was a component in that case as well. I think there are others, but I can't recall. But it would be -- on the others, it would be another component of a number of constituents as well, as I recall.

Q Do you know the remedy that the plaintiffs are seeking in this case? I'm sorry if I already asked you this.

A Can you be more specific?

Q Do you know what plaintiffs are seeking to get from this case?

A Not exactly.

Q What is your general understanding? You don't need to read the complaint. I'm just asking what you know.

A Again, I don't really -- sometimes the legal language is different than scientific language.

Q I'll tell you I didn't know what they were asking for when I read that complaint, so I don't think you are going to know.

But they've provided specific information about the specific remedy they want. Has any of that information been provided to you?

A Not that I recall.

MS. STEVENSON: I don't have any further

questions.

MR. STALPES: Can you give us five minutes?

MS. STEVENSON: Yes, but I would love to try to make my flight, if I can.

05:22 MR. STALPES: What time is your flight?

MS. STEVENSON: 7:35.

MR. STALPES: Give us one minute.

THE VIDEOGRAPHER: Going off the record. The time now is approximately 5:22 p.m.

05:24 (Off the record.)

THE VIDEOGRAPHER: Going back on the record. The time now is approximately 5:25 p.m.

EXAMINATION

05:24 BY MR. STALPES:

Q Rick, I just wanted to clarify a couple of points.

On this last line of questioning that you went through, you were asked whether you know exactly 05:24 what the plaintiffs are looking for in this case.

Now, have you come to learn through this litigation, and I'm talking about even before today, that one of the things that plaintiffs were seeking was to have their soil cleaned up to background 05:25 levels?

A Yes. That was one thing that I have heard as a part of a conversation or conversations.

Q And do you know whether that's -- whether that occurs in the field of environmental cleanups and pollution, where a screening level could fall below a background but then the action level is set to the background level?

A Yes, that is common.

Q Okay. And you testified earlier, I think maybe you were confused by the question, whether you asked the attorneys to gather any information on your behalf. I am not expecting you to specifically remember that.

But I will just ask you, did you ask me or the other attorneys to gather some information for you from the plaintiffs in the litigation?

A Yes. Again, it was more trying to understand what the possible pathways would be to obtain information on vegetables, pets, information on whether or not anybody grows beef or grows animals for consumption. General information like that.

MR. STALPES: That's all I have.

MS. STEVENSON: Great.

THE VIDEOGRAPHER: This concludes the deposition of Richard Pleus. The time now is approximately

5:27 p.m. This is the end of disk number 4. Going off the record.

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REPORTER'S DEPOSITION TIME LOG:

REPORTER - MARIANNA DONNER

DATE - MONDAY, JULY 29, 2013

WITNESS - RICHARD C. PLEUS, Ph.D.

ATTORNEY	ON RECORD	OFF RECORD	TOTAL
STEVENSON	9:36 A.M.	10:33 A.M.	0:57
	10:46 A.M.	11:47 A.M.	1:01
	12:00 P.M.	1:08 P.M.	1:08
	1:54 P.M.	2:44 P.M.	0:50
	2:55 P.M.	4:14 P.M.	1:19
	4:26 P.M.	5:22 P.M.	0:56
		TOTAL USED:	6:11
STALPES	5:25 P.M.	5:27 P.M.	0:02
		TOTAL USED:	0:02

STATE OF _____)
) ss.
COUNTY OF _____)

I, the undersigned, say that I have read the foregoing deposition, and I declare, under penalty of perjury under the laws of the State of California, that the foregoing is a true and correct transcript of my testimony contained therein, incorporating any and all changes and/or corrections as noted by me.

EXECUTED this _____ day of _____, 2013, at _____.

_____

RICHARD C. PLEUS, Ph.D.

I, the undersigned, a Certified Shorthand Reporter of the State of California, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that any witnesses in the foregoing proceedings, prior to testifying, were placed under oath; that a verbatim record of the proceedings was made by me using machine shorthand which was thereafter transcribed under my direction; further, that the foregoing is an accurate transcription thereof.

I further certify that I am neither financially interested in the action nor a relative or employee of any attorney of any of the parties.

IN WITNESS WHEREOF, I have this date subscribed my name.

Dated: _____

_____

MARIANNA DONNER, CSR, RPR, CLR

CSR No. 7504

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